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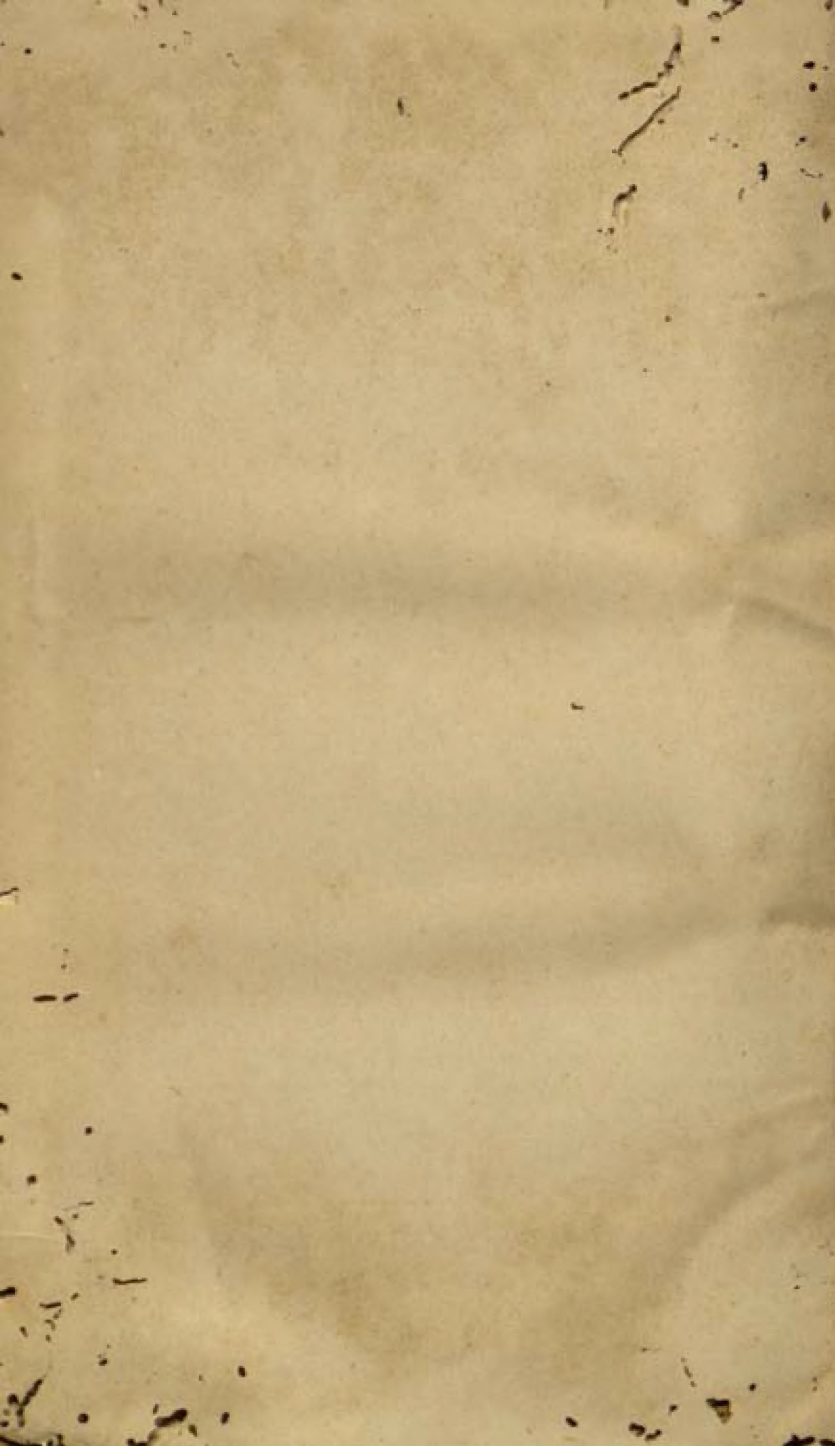
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THE
JOURNAL
OF THE
ROYAL GEOGRAPHICAL SOCIETY.

VOLUME THE TWENTY-FIFTH.

25231



1855.

910.5
J.R.G.S.

EDITED BY DR. NORTON SHAW.



LONDON:

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Royal Geographical Society.

1855.

REPORT OF THE COUNCIL,

READ AT THE ANNIVERSARY MEETING ON THE 28TH MAY.

THE duty of submitting to the Fellows of the Royal Geographical Society a yearly statement of its progress and financial position has never been more agreeable than on the present occasion, when, favoured by the liberality of Her Majesty's Government, the Council is at length enabled to hold the Anniversary Meeting of the members of the Society in their own house, and in apartments befitting the importance of their pursuits.

Members,—Ordinary, Honorary and Corresponding.—Since the last Anniversary 72 members have been added to the lists of the Society.

In the same period the Society has lost many valuable and distinguished associates. The Council has to report the decease of one honorary member—M. Beautemps-Beaupré, and of 21 ordinary members; also to record the resignation of one ordinary member.

The Society now consists of 57 honorary and corresponding members, and 804 ordinary members.

House and Finance.—At the last Meeting the President had the satisfaction of announcing that Her Majesty's Ministers had decided to recommend a yearly grant of 500*l.* in aid of the operations of the Society, and for the purpose of rendering its Maps and Charts available for public reference; also that the Council had taken steps for carrying out arrangements in accord-

ance with the Treasury Minute. The results of these arrangements are now confidently submitted for approval. The Map-rooms are daily visited by intelligent strangers as well as by members generally, and the Meeting-room, Library, and other Offices afford facilities not before possessed for the collection and diffusion of geographical information. The Society's premises have undergone considerable alteration; and although a large expenditure has been unavoidable in making the necessary arrangements, it is very gratifying to the Council to be enabled to state, that the funds required for such purposes have been provided from the ordinary resources of the Society, and that every account has been duly discharged.

The Balance-sheet of the past year, accompanying this Report, shows a continued improvement of income under each head of receipt; whilst the expenditure, including a large portion of outlay for the new house, has not exceeded the estimates submitted at the last Anniversary.

The Auditors, after examination of the Society's accounts, testify their satisfaction at the evidence, thereby afforded, of the zeal and ability with which the duties of Secretary, in regard to the financial arrangements of the Society, have been discharged by Dr. Norton Shaw, and the diligence and good conduct of the officers engaged under his superintendence and direction.

Regulations.—The removal of the Society has rendered it liable to a claim for local rates, from which, the Council is advised, it may be relieved by incorporating in its Rules the following clause contained in the Act 6 & 7 Victoria, c. 36, viz., "That the Society shall not and may not make any dividend, gift, division, or bonus in money unto or between any of its members." The Council recommend that the addition of this clause to the Regulations be now adopted.

Publications.—The 24th volume of the Society's Journal, edited by Dr. Shaw, contains many valuable papers and maps, also a condensed notice, entitled 'Hints to Travellers,' drawn up by direction of the Council, of which separate copies may be obtained by travellers upon application to the Secretary.

The following Institutions have been added to the list of those to which the Journals of the Society are presented, viz., the

Cambridge University Library; the Advocates' Library, Edinburgh; the Historic Society of Lancashire and Cheshire; the Bodleian Library, Oxford; and the University of Jena.

Map-rooms.—The Council gladly recognises the services of Mr. Trelawney Saunders in the removal and arrangement of the Society's extensive collection of Maps and Charts. The additions to this department during the past year consist of 7 Atlases and 225 sheets of Maps and Charts, among which may be especially noticed the new edition of Johnston's Physical Atlas; Russian Cadastral Maps, in 24 sheets; 16 additional sheets of the Government Map of Sardinia; 5 sheets of the Topographical and Military Map of Holland, prepared by the officers of the Dutch General Staff; also Charts of the South Coast of Australia and of Java, presented by the Chevalier Jacob Swart of Amsterdam, corresponding member of this Society; French Charts, 27 in number, published and presented by the Imperial Dépôt de la Marine; 7 sheets of the Trigonometrical Survey of India, by the Honourable East India Company; Greenough's Geological Map of India, in 4 sheets; Johnston's General Map of Europe; Arrowsmith's South-Western Crimea; the original Manuscript Maps by Dr. Livingston and Mr. Andersson of their routes through the interior of South Africa; and a Map of the World, constructed by order of the Council to show the routes of modern travellers.

Library.—The contributions to the Library since the last Report amount to 528 volumes of books and pamphlets, a list of which is laid upon the table, and will be printed in the Journal. In this list are comprised the following, among other important works:—Congress and United States Coast Survey Reports; Contributions to Knowledge, and other works, presented by the Smithsonian Institution; several works relating to Borneo, Malacca, and the Dutch possessions in the East, presented by the Royal Institute of Dutch India; a collection of 30 volumes, chiefly Portuguese, presented by Mr. J. W. Dover; Sir Roderick Murchison's 'Siluria,' presented by the author; works published by the Hakluyt Society; Boné's Itineraries in European Turkey; Herndon and Gibbon's works on the Amazon; Further Papers relative to recent Arctic Expedi-

tions, presented by Mr. Barrow; Transactions of the Imperial Geological Institute of Vienna; of the Lombardo-Veneto Institute of Milan; of the Academies of Paris, Madrid, Berlin, Copenhagen, Stockholm, and Christiania, as also of other foreign Societies; and Mr. Brierly's admirable sketches of the Allied Fleets in the Baltic.

Private Donation.—Testifying to the last his warm regard for the Institutions with which from their commencement he had been so intimately connected, Mr. Greenough has bequeathed to the Geological and Geographical Societies of London all his collections of books, maps, charts, sections, and engravings relating to Geology and Geography, to be suitably apportioned by his executors, together with the sum of 500*l.* to each Society for the expense of accommodating such collections and for general purposes.

On receipt by the Geographical Society of its portion of this munificent bequest, arrangements will forthwith be made by the Council for carrying into effect, with respect to it, the wishes of the Testator.

Royal Premium.—The Patron's Gold Medal has been awarded to Dr. Livingston for his recent explorations in Africa, between Lake Ngami and the Portuguese settlements on the West Coast; and a Testimonial of the value of Twenty-five Guineas in Surveying Instruments, bearing a suitable inscription, to Mr. Charles John Andersson, for his travels in South-Western Africa, as laid down in his route-map communicated to the Society.

The Council has finally to notice a communication from the Lords of the Committee of the Privy Council on Education, requesting the Society to appoint an Examiner in Geography, to be associated with Professor Mosely and Mr. Sandford. The Council having, in accordance with this requisition, directed Dr. Shaw to act in conjunction with the Government Inspectors for the purposes specified in their Lordships' communication, a letter of thanks, for the valuable assistance rendered by him at the April examination, has been transmitted to the Society.

BALANCE-SHEET FOR THE YEAR 1854.

Receipts.		Expenditure.	
£.	s. d.	£.	s. d.
Subscriptions of 354 Fellows	708 0 0	Removal and Building Expenses	588 13 7
Compositions of 23 Fellows	575 0 0	House Rent and Fixtures	533 7 1
Entrance Fees of 104 Fellows	312 0 0	Salaries—Secretary and Clerks	443 0 0
Government Grant	500 0 0	Journal and Illustrations	338 18 11
Journals and Indices sold	124 18 6	Wages and Collector's Poundage	69 16 0
Arrears of Subscriptions paid	90 0 0	Office Expenses	138 11 8
Dividends on 2000 <i>l.</i> 3 <i>d.</i> per Cent.	62 3 2	Royal Premium—Cost of Medals	46 14 0
Royal Premium Grant	52 10 0	Books, Binding, and Diagrams	21 17 0
East India Company's Contribution	50 0 0	Sundries overpaid and returned	17 1 0
Expedition Account repaid	75 0 0	Bankers' Balance, 31st Dec., 1854	£ 1178 12 9
Sundries	15 16 0	Less Petty Cash overpaid	24 6 5
Bankers' Balance, 1st January, 1854	772 12 3		1154 6 4
Petty Cash	14 5 8		
	£ 3352 5 7		£ 3352 5 7

ROBERT BIDDULPH, Treasurer.

Examined and found correct.
15, Whitehall Place, 22nd March, 1855.

THOS. H. BROOKING,
WM. H. SMYTH,
E. OSBOENE SMITH, Auditors.

ESTIMATE FOR THE YEAR 1855.

Receipts.		Expenditure.	
£.	s. d.	£.	s. d.
Annual Subscriptions	700 0 0	Balance of Removal Expenses	800 0 0
Life Compositions	150 0 0	Rent, Wages, Lights and Fires	600 0 0
Entrance Fees	180 0 0	Salaries	600 0 0
Arrears of Subscriptions	50 0 0	Journal and Illustrations	600 0 0
Sales of Journals and Indices	100 0 0	Office Expenses	200 0 0
Dividends on Stock	60 0 0	Royal Premium Awards	52 10 0
Royal Premium	52 10 0	Fire Assurance and Advertisements	50 0 0
Government Grant	500 0 0	Library and Map Rooms	500 0 0
Greenough Bequest	500 0 0	Sundries for Balance	44 6 4
Cash Balance, 1st January, 1855	1154 6 4		
	£3,446 16 4		£3,446 16 4

NORTON SHAW, Secretary.

Library Regulations.

I. The Library shall be open every day in the week (Sundays excepted) from *Eleven* in the morning to *Five* in the afternoon, except on New Year's Day, Good Friday to Easter Monday inclusive, and Christmas week; and it shall be closed one month in the year, in order to be thoroughly cleaned, viz. from the first to the last day of September.

II. Every Member of the Society shall be entitled (subject to the Rules) to borrow as many as four volumes at one time.

Exceptions:

1. Dictionaries, Encyclopædias, and other works of reference and cost, Minute Books, Manuscripts, Atlases, Books and Illustrations in loose sheets, Drawings, Prints and unbound Numbers of Periodical Works, *unless with the special written sanction of the President.*
2. Maps or Charts, *unless by written order of the President, Council, or Secretaries.*
3. New Works before the expiration of a month after reception.

III. The title of every Book, Pamphlet, Map, or Work of any kind lent, shall first be entered in the register, with the borrower's signature, or accompanied by a separate note in his hand.

IV. No work of any kind shall be retained longer than one month; but at the expiration of that period, or sooner, the same shall be returned free of expense, and may then, upon *re-entry*, be again borrowed, provided that no application shall have been made in the mean time by any other Member.

V. In all cases a list of the Books, &c., or other property of the Society, in the possession of any member, shall be sent in to the Secretary *on or before the 1st of July in each year.*

VI. In every case of loss or damage to any volume, or other property of the Society, the borrower shall make good the same.

VII. No stranger shall be admitted to the Library except by the introduction of a Member, whose name, together with that of the Visitor, shall be inserted in a book kept for that purpose.

VIII. Members transgressing any of the above Regulations shall be reported by the Secretary to the Council, who will take such steps as the case may require.

By Order of the Council,

NORTON SHAW.

December 9, 1850.

ROYAL GEOGRAPHICAL SOCIETY.

Patron.

THE QUEEN.

Vice-Patron.

H. R. H. PRINCE ALBERT.

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(23)

FELLOWS.

N.B.—*Those having * preceding their names have compounded for life.*
Those having † have requested to be placed on the list as abroad.

Year of Election.	
1836	Aberdeen, George, Earl of, K.G., K.T., M.A., F.R.S. <i>Argyll-house, Argyll-street; and Hadlo-house, Aberdeen.</i>
1855	Acland, Prof. Henry Westworth, M.D. <i>Oxford.</i>
1853	Acland, Sir Peregrine Palmer F. P., Bart. <i>Fairfield, Somerset.</i>
1836	*Acland, Sir Thomas Dyke, Bart., M.P., F.R.S. <i>Waterloo-hotel, Jernyn-street; and Killerton-park, Devon.</i>
1836	*Ainsworth, William Francis, Esq., F.S.A. <i>Ravenscourt-villa; New-road, Hammer-smith.</i>
1836	*Albemarle, George Thomas, Earl of. <i>Brooks' Club, St. James'; Quiddensham-hall, Larkingford, Norfolk; and Elvedon-hall, Suffolk.</i>
1834	*Alcock, Thomas, Esq., M.P. <i>105, Eaton-place; and Kingswood-warren, near Epsom, Surrey.</i>
1858	*Aldam, William, Esq.
1836	Alexander, Lieut.-Col. Sir Jas. Edward, K.L.S., F.R.A.S., etc. <i>Malta.</i>
1855	10 Alger, John, Esq. <i>Oriental Club, Hanover-square.</i>
1835	*Allen, Capt. Wm., R.N., F.R.S. <i>Athenaeum Club.</i>
1854	Ancona, J. S., Esq. <i>24, Upper Woburn-place, Tavistock-square; and 8, John-street, Adelphi.</i>
1835	Anderson, Robert, Esq., Surgeon, R.N. <i>Messrs. Woodhead and Co., 1, Janes-street, Adelphi.</i>
1836	Anstet, Prof. D. T., M.A., F.R.S., etc. <i>17, Manchester-street, Manchester-square.</i>
1836	*Antrobus, Sir Edmund, Bart. <i>146, Piccadilly; Lower Chesson, Epsom, Surrey; and Amesbury, Wilts. -</i>
1835	*Arden, Richard Edward, Esq. <i>Smyburg-park, Middlessex.</i>
1836	*Arrowsmith, John, Esq., F.R.A.S. <i>10, Soho-square.</i>
1853	*Ashwell, James, Esq., C.E. <i>39, Westbourne-terrace, Hyde-park.</i>
1856	Ashwell, the Rev. Arthur Lawson, M.A., Principal of Oxf. Dioc. Training College. <i>The College, Cutham, Oxon.</i>
1831	20 Astley, Francis D. P., Esq., M.E.I. <i>Fellfoot, Nidthorpe.</i>
1836	Atkins, John Pelly, Esq., F.S.A. <i>Halsted-house, near Sevenoaks.</i>
1839	*Attwood, Matthias Wolverley, Esq. <i>27, Gracechurch-street.</i>
1833	Auldjo, John, Esq., F.R.S. <i>Noel-house, Kensington; and Penigbael, Argyllshire.</i>
1834	Ayrton, Acton, Esq. <i>24, Grafton-street, Bond-street.</i>
1846	*Ayrton, Frederick, Esq. <i>Egypt.</i>
1836	*Bac, Sir Geo., D.C.L., F.R.S., Capt. R.S. <i>109, Gloucester-place, Portman-square.</i>
1855	Baile, Wm. Balfour, Esq., M.D., R.N. <i>Harker Hospital, Gosport.</i>

Year of Election.	
1834	*Baillie, David, Esq., F.R.S. 14, <i>Belgrave-square</i> ; and <i>Hill-park, Surrey</i> .
1830	*Bally, Arthur, Esq., F.R.A.S. 4, <i>Cumberland-place, Regent's-park</i> ; and <i>Harefield, Southampton</i> .
1850	30 Bainbridge, Joseph, Esq. 21, <i>Hyde-park-gardens</i> .
1830	*Baker, Colonel G. 31, <i>Grosvenor-place, Bath</i> .
1835	Baker, Lieut. Wm. T., 25th Regt. 31, <i>Grosvenor-place, Bath</i> .
1853	Balfour, John C. B., Esq. <i>New South Wales</i> ; and <i>Colinton, Moreton Bay</i> .
1847	Balfour, Lieut.-Colonel George, M.A. <i>East Indies</i> .
1852	Bancroft, Lieut. W. C., 16th Regt. <i>Aide de Camp and Military Sec., Jamaica</i> .
1840	*Barclay, Arthur Kett, Esq., F.R.S. <i>Park-street, Borough</i> ; and <i>Bury-hill, Dorking, Surrey</i> .
1852	Barclay, David, Esq. <i>Eastwick-park, Surrey</i> .
1849	Barclay, John, Esq. 7, <i>Jeffreys-square, St. Mary Axe</i> .
1838	Baring, Right Hon. Sir Francis Thornhill, Bart., M.P., F.R.S. 68, <i>Eaton-place</i> ; and <i>Stratton-park, Andover, Hants</i> .
1835	40* Baring, John, Esq.
1844	*Baring, Thomas, Esq., M.P. 41, <i>Upper Grosvenor-street</i> .
1853	Barnett, Capt. Edward, R.N. 20, <i>Keppel-street, Bedford-square</i> .
1854	†Bazres, Don José Antonio. <i>Santamaría, New Granada</i> .
1833	Barrow, John, Esq., F.R.S., F.S.A. 7, <i>New-street, Spring-gardens</i> .
1837	*Bateman, James, Esq., F.R.S., L.S. <i>Knyppersley-hall, Staffordshire</i> .
1852	*Bates, Joshua, Esq. 21, <i>Arlington-street, Piccadilly</i> ; and <i>East Sheen, Surrey</i> .
1852	Beaumont, Nathaniel, Esq., C.E. 30, <i>Great George-street, Westminster</i> .
1830	Beaufort, Rear-Admiral Sir Francis, K.C.B., D.C.L., F.R.S., Corr. Inst. France. 11, <i>Gloucester-place, Portman-square</i> .
1854	Beaufort, William Morris, Esq., Bengal Civil Service. 11, <i>Gloucester-place, Portman-square</i> .
1851	50 Beaumont, Wentworth B., Esq., M.P. 25, <i>St. James's-place</i> ; <i>Bywell-hall, Newcastle-upon-Tyne</i> ; and <i>Bretton-park, Wakefield</i> .
1830	*Becher, Commander Alex. B., R.N. <i>Admiralty</i> ; and 29, <i>Upper Gloucester-place</i> .
1838	*Beckford, Francis, Esq. <i>Traveller's Club</i> .
1854	Bedford, Commander Edward James, R.N. <i>Okla, N.B.</i>
1855	Beddingfield, Lieut. Norman B., R.N. <i>H.M.'s Yacht 'Victoria and Albert'</i> .
1853	Beedley, Rear-Adm. F.W., V.P.R.S., F.R.A.S. 8, <i>Westbourne-crescent, Hyde-park</i> .
1846	Beke, Charles Tiltone, Esq., Ph. Dr., F.S.A., &c. <i>Mauritius</i> .
1850	*Belcher, Capt. Sir Edward, C.B., F.R.A.S., R.N. <i>Union Club</i> ; and 6, <i>Pelham-villa, Onslow-square, Brompton</i> .
1853	Belcher, Rev. Brymer. 46, <i>St. George's-road, Finsbury</i> .
1848	Beldam, Joseph, Esq. 3, <i>Flower-dean-buildings, Temple</i> ; and <i>Royston, Cambridgeshire</i> .
1850	60* Bell, James, Esq., M.P. 1, <i>Devonshire-place, Portland-place</i> .
1830	*Bell, James Christian C., Esq. 42, <i>Westbourne-terrace</i> ; and 15, <i>Angel-court, Throgmorton-street</i> .
1830	*Bennett, John Joseph, Esq., F.R.S. <i>British Museum</i> .
1830	Bentham, George, Esq., F.R.S. 91, <i>Victoria-street, Westminster</i> .

Year of
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- 1856 Berry, Josiah, Esq. 16, *Regent-square*; and *Parthenon Club*.
- 1842 *Bethune, Rear-Admiral C. R. Drinkwater, C.B.
- 1836 Betts, John, Esq. 115, *Strand*.
- 1845 Bidulph, Robert, Esq. 43, *Charing-cross*; 31, *Eaton-place*; and *Leadbury, Herefordshire*.
- 1850 Bigsby, John J., Esq., M.D. 89, *Gloucester-place, Portman-square*.
- 1847 *Bird, James, Esq., M.D. 27, *Hyde-park-square*.
- 1851 70 Bird, W. Wilberforce, Esq. 22, *Stones-square, Hyde-park*.
- 1836 *Blamw, William H., Esq., M.A., F.S.A., F.Z.S. 3, *Queen Anne-street*; and *Beechlands, near Uckfield, Sussex*.
- 1849 Blackie, W. Graham, Esq., Ph. Dr. 10, *Ken-terrace, Glasgow*.
- 1851 Blackwell, Thomas Evans, Esq., C.E. 10, *Corn-street, Bristol*.
- 1854 Blaine, D. Robertson, Esq., Barrister-at-Law. 3, *Paper-buildings, Temple*; and 24, *Bonfoy-terrace, Maida-vale*.
- 1830 *Blanchard, Henry, Esq., F.R.A.S. 53, *Chancery-lane*.
- 1854 Blencowe, Robert, Esq. *The Hook, Leam*.
- 1839 *Blewitt, Octavian, Esq. 73, *Great Russell-street*.
- 1843 *Bliss, Rev. Frederick. *Iwerne Courtney, Blandford*.
- 1852 Block, Samuel Richard, Esq. *Green-hill, near Whetstone, Herts*.
- 1837 80 *Blunt, Joseph, Esq.
- 1851 Bols, Henry, Esq. 110, *Fenchurch-street*.
- 1850 Bollert, William, Esq. 17, *Grucechurch-street*; and 1, *Shrubland-grove East, Queen's-road, Dalston*.
- 1834 *Borradaile, Abraham, Esq. 34, *Fenchurch-street*.
- 1836 Borradaile, William, Esq. 20, *King's Arms-yard*.
- 1845 *Borror, Dawson, Esq. *Barrow-hill, Henfield, Sussex*.
- 1839 *Botfield, Beriah, Esq., F.R.S., F.S.A. 10, *Sackville-street, Piccadilly*; and *Norton-hall, Northamptonshire*.
- 1853 Bourne, Henry, Esq. *Ashted-house, Birmingham*.
- 1855 Bovet, Charles, Esq. 2, *Cornwall-crescent, Camden Town*.
- 1854 *Bowen, George Ferguson, Esq., M.A. *Fellow of Brasenose College, Oxford*; and *Permanent Secretary to the Lord High Commissioner of the Ionian Islands*.
- 1836 90 Bower, George, Esq. 6, *Tolleshaw-yard, City*.
- 1833 Bowles, Vice-Admiral William, C.B. 8, *Hill-street, Berkeley-square*.
- 1856 Bowman, John, Esq. 9, *King William-street, City*.
- 1854 †Bowling, Sir John, LL.D. *Governor and Commander-in-chief, Hong Kong*.
- 1845 *Boyd, Edward Lennox, Esq., F.S.A. 8, *Waterloo-place, Pall-mall*.
- 1856 Boyne, G. F. J., J. Haklitt-Russell, Viscount. 22, *Belgrave-square, &c.*
- 1851 Bracebridge, Charles Reil, Esq. *Atherstone, Warwick*.
- 1855 Brackley, Viscount. *Bridgewater House*.
- 1854 Brand, George, Esq., M.A., F.S.A. *H.M.'s Consul, Angola*; and *Stonhaven, N.B.*
- 1852 *Breadalbane, John, Marquis of, K.T., F.R.S. 21, *Port-lane*; and *Taymouth-castle, Aberfeldie*.
- 1845 100 *Brent, George Smith, Esq. 13, *Caroline-street, Bedford-square*.
- 1846 Brereton, Rev. C. D., M.A. *Little Massingham, Rougham, Norfolk*.

Year of Election.	
1833	*Brereton, Rev. John, LL.D., F.S.A. <i>Bedford.</i>
1834	*Breton, William Henry, Esq., Lieut. R.N., M.R.I. <i>Junior United Service Club; and 15, Condon-place, Bath.</i>
1852	*Brierly, Oswald Walters, Esq. 2, <i>Hardwick-place, Mornington-crescent.</i>
1854	Bride, Lieut. Frederick, R.E. <i>Claremont, Sidmouth; and Crimea.</i>
1833	*Brisbane, Gen. Sir Thomas M., Bart., G.C.B., G.C.H., D.C.L., F.R.S., &c. <i>Makerstown, Kells, Scotland.</i>
1833	*Brodie, Sir Benjamin Collins, Bart., D.C.L., V.P.R.S., &c., Serjeant Surgeon to the Queen. 14, <i>Smile-rose; and Broome-park, Surrey.</i>
1848	Broke, Sir George N., Bart., Captain R.N. <i>Broke-hall, Suffolk.</i>
1830	*Brooke, Sir Arthur de Capell, Bart., M.A., F.R.S. <i>Athenaeum Club; and Oakley, near Kettering, Northamptonshire.</i>
1838	110 Brooke, Sir James, K.C.B., D.C.L. <i>Rajah of Sarawak, Borneo.</i>
1856	*Brooking, George Thomas, Esq. 10, <i>Connaught-square.</i>
1856	*Brooking, Marmaduke Hart, Esq. 85, <i>Gloucester-place, Portman-square.</i>
1843	*Brooking, Thomas Holdsworth, Esq. 14, <i>New Broad-street, City; and 85, Gloucester-place, Portman-square.</i>
1850	Broughton, John, Lord, G.C.B., M.A., F.R.S. 42, <i>Berkeley-square; and Erlestoke-park, Wilts.</i>
1837	Brown, John, Esq., F.R.S.N.A. 3, <i>Newcastle-place, Clerkenwell.</i>
1830	*Brown, Robert, Esq., Hon. D.C.L., F.R.S., Memb. Inst. Fr., St. Pet., Berlin, V.P. Linn. Soc., &c. 17, <i>Dean-street, Soho.</i>
1852	Browning, Henry, Esq., M.R.I. 72, <i>Grosvenor-street; and Ampton-hall, Bury St. Edmund's.</i>
1852	*Brunel, Isambard Kingdom, Esq., F.R.S., &c. 18, <i>Duke-street, Westminster.</i>
1844	Bryden, William, Esq. 4, <i>New Palace-yard, Westminster.</i>
1843	120 *Buchan, John H., Esq. <i>Mexico.</i>
1830	Bullock, Capt. Frederick, R.N. <i>Woolwich.</i>
1836	Benbury, E. H., Esq., M.A. 15, <i>Jermyn-street.</i>
1850	Bansen, The Chevalier. <i>Heidelberg.</i>
1837	*Burlington, William, Earl of, LL.D., M.A., F.R.S. 10, <i>Belgrave-square; and Hardwick-hall, Derbyshire.</i>
1830	*Burney, Ven. Archd. Charles Parr, D.D., F.R.S., F.S.A. <i>Rectory-house, Bishop's Wickham, Essex.</i>
1830	*Barton, Alfred, Esq. 36, <i>Marina, St. Leonard's.</i>
1833	*Burton, Decimus, Esq., F.R.S., S.A. 6, <i>Spring-gardens; and St. Leonard's-cottage, Hastings.</i>
1851	*Buxton, Sir Edward North, Bart. 10, <i>Upper Grosvenor-street; and Colne-house, Cromer, Norfolk.</i>
1851	Dynce, Benjamin, Esq., Surgeon R.N. <i>H.M.S. 'Madagascar,' Rio de Janeiro.</i>
1854	130 Byron, the Hon. Frederic, 43, <i>Park-street, Grosvenor-square; and Langford, Maldon, Essex.</i>
1830	*Cabbell, B. B., Esq., M.P., M.A., F.R.S., F.S.A. 1, <i>Brick-court, Temple; 52, Portland-place; and Aldwick, Sussex.</i>

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- 1856 *Calthorpe, the Hon. F. H. Gough. 33, Grosvenor-square.
- 1854 Calvert, Frederic, Esq., Q.C. 9, St. James's-place; and 8, New-square, Lincoln's-inn.
- 1854 Calvert, John, Esq. 189, Strand; and Kensington-park, Notting-Hill.
- 1830 *Camden, George Charles, Marquis, K.G., D.C.L., M.A. 19, Belgrave-square; Wilderness-park, Sevenoaks, Kent; and Bayham-alley, Sussex.
- 1844 *Campbell, James, Esq.
- 1834 *Campbell, James, Esq., jun., M.R.I. Hampton Court-green.
- 1851 Campbell, Lieut.-Colonel Neil. India.
- 1853 *Cardwell, Right Hon. Edward, M.P. 74, Eaton-square.
- 1830 140 *Cartwright, Samuel, Esq., F.R.S., F.S.A. 32, Old Burlington-street; and Nisell's-house, Tunbridge.
- 1844 *Chadwick, Hugo Mavesyn, Esq. New Hall, near Sutton-Coldfield.
- 1855 Chapman, John, Esq. 124, Pall Mall; and Leadenhall-street.
- 1834 *Chapman, Capt. John James, R.A. Athenaeum Club; and Sheen's-cottage, Hantsley-road, Kentish-town.
- 1840 Charters, Major Samuel, R.A. Athenaeum Club; and 3, Bedford-street, Jamaica-square, Bath.
- 1855 Cheshire, Edward, Esq. Conservative Club; and 5, Charles-street, Westbourne-terrace.
- 1838 *Chesney, Major-General Francis Rawdon, R.A., D.C.L., F.R.S. Athenaeum Club; and Ballygarra, Kithool, Down, Ireland.
- 1850 Christmas, Rev. H., M.A., D.C.L., F.R.S., F.S.A. 30, Manor-street, Clapham.
- 1854 Christy, Henry, Esq. Woodbines, near Kingston, Surrey.
- 1854 *Church, John Wm., Esq., B.A. United University Club; and Woodside, Hatfield.
- 1830 150 *Church, W. H., Esq.
- 1849 Churchill, Lord Alfred. 6, Dury-street, St. James's; and 12, Upper Belgrave-street, Belgrave-square.
- 1853 Clarendon, George William, Earl of, K.G., G.C.B. 1, Grosvenor-crescent; The Grove, Watford, Herts; and Hindon, Wills.
- 1852 Clark, Daniel, Esq. 49, Milner-square, Islington.
- 1840 *Clark, Sir James, Bart., M.D., F.R.S., Physician to the Queen. 22 b, Brook-street.
- 1851 Clark, Rev. Samuel, M.A. Principal of the Training College, Battersea.
- 1830 *Clarke, Sir Chas. Mansfield, Bart., M.D., F.R.S. Wigginton-hedge, Tansworth, Staffordshire.
- 1855 Clarke, Rev. W. B., M.A. Sydney, New South Wales.
- 1842 *Clavering, Sir William Aloysius, Bart. 13, Charles-street, Haymarket; Ansell-park, near Gateshead; and Greencroft, Durham.
- 1830 *Clerk, Rt. Hon. Sir George, Bart., D.C.L., F.R.S., &c. Clifton; and Penicuik-house, Edinburgh.
- 1836 160 Clive, Rev. Archer. Whitfield, Hereford.
- 1854 Clowes, George, Esq. Stamford-street, Blackfriars; and 37, Russell-square.
- 1854 Clowes, William, Esq. Stamford-street, Blackfriars; and Garretts, Banstead, Surrey.
- 1852 Cobbold, John Chevallier, Esq., M.P. Athenaeum Club; 23, Suffolk-street; and Ipswich, Suffolk.

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- 1841 *Cocks, Reginald S. T., Esq. 43, *Charing-cross*; and 36, *Upper Harley-street, Cavendish-square*.
- 1838 Colchester, Charles, Lord, Rear-Admiral, D.C.L. 34, *Berkeley-square*; and *Kilbrooke, Sussex*.
- 1853 Cole, John Griffith, Esq., M.A., M.R.I. 8, *Charles-street, Berkeley-square*.
- 1841 *Colebrooke, Sir Thomas Edward, Bart., F.R.A.S. 18, *Park-lane*.
- 1834 Colebrooke, Major-General Sir Wm., M.G., C.B., K.H., F.R.A.S. *Gov. and Com.-in-Chief of Windward and Leeward Islands*.
- 1854 Coleman, Everard Hoine, Esq., F.R.A.S. *Registry and Record Office, Hammet-street, Minorics*.
- 1848 170 Coles, Charles, jun., Esq. 86, *Great Tiner-street*.
- 1835 *Collett, William Rickford, Esq.
- 1855 Collinson, Captain Richard, C.B., R.N. *Boldon, Gateshead, Northumberland*.
- 1845 Colquhoun, Patrick de, Esq., LL.D., M.A. 3, *Hare-court, Inner Temple*.
- 1830 *Conybeare, the Very Rev. William Daniel, Dean of Llandaff, M.A., F.R.S. *Deanery, Llandaff*.
- 1843 *Cook, James, Esq. 40, *Munchy-lane*.
- 1852 Cooke, Robert, Esq. 38, *Nottingham-place, New Bond*.
- 1830 Cooley, William Desborough, Esq. 33, *King-street, Holborn*.
- 1843 *Cooper, Capt. D. S., 1st Royal Regt. *Army and Navy Club*.
- 1853 Coote, Charles Chisley, Esq. *Mount-Coote, Limerick, Ireland*.
- 1853 180 Copley, Sir Joseph William, Bart. *Sprotborough, Doncaster*.
- 1839 *Corrance, Frederick, Esq. *Parkham-hall, Framlingham, Suffolk*.
- 1853 *Cosway, William Halliday, Esq. 32 a, *Mount-street*.
- 1854 Cowley, Norman, Esq. 4, *Montagu-place, Montagu-square*.
- 1854 Cox, Dr. Travers. *Fulham*.
- 1853 Cracroft, Captain Peter, R.N. *H.M.S. 'Gorgon,' Stillwell's*.
- 1853 Craufurd, Commander Frederic A. B., R.N. *Army and Navy Club; and H.M.S. 'Sealoe,' Mediterranean*.
- 1830 *Craufurd, Commander Henry W., R.N.
- 1848 Crawford, Robert Wigram, Esq. 71, *Old Broad-street, City*.
- 1830 Crawford, John, Esq., F.R.S. *Athenæum Club*.
- 1854 190 *Creswell, Commander Gurney, R.N. *Lynn, Norfolk*.
- 1850 Croker, T. F. Dillon, Esq. 6, *Strand*.
- 1852 Crowley, James, Esq. 17, *Sergeants'-inn*.
- 1839 *Cubitt, Sir William, F.R.S., C.E. 19, *Great George-street, Westminster; and Clapham-common, Surrey*.
- 1844 *Cubitt, Alderman William, M.P. *Gray's-inn-road; and 21, Abchurch-lane, City*.
- 1853 Cumming, Alexander, Esq., Inspector-Gen. of Hospitals. *Army and Navy Club*.
- 1847 *Cusard, Edward, Esq. *New York*.
- 1853 Cunard, Samuel, Esq. *Howchin's Hotel, St. James's-street*.
- 1850 Cuninghame, George Cornan, Esq. *Thornton-house, Kilmarnock*.
- 1838 *Cunningham, George Godfrey, Esq. 2, *Hillside-crescent, Edinburgh*.
- 1853 100 Cunningham, John Wm., Esq., Sec. King's College. *Somerset-house; and Harrow*.
- 1852 Cuninghame, Major-General Arthur Aug. T. *United Service Club; and Crimea*.

Year of Election.	
1843	*Cursetjee, Manockjee, Esq. <i>Vilka-Digulla, Bombay.</i>
1836	*Curtis, Timothy, Esq.
1851	Cust, Robert, Esq., Hon. E. I. Company's Civil Service. <i>Oriental Club.</i>
1854	Daniell, James Nugent, Esq. <i>Esher, Surrey.</i>
1851	*Daniell, William Freeman, Esq., M.D., F.L.S., Surgeon to the Forces. <i>W. Africa.</i>
1838	*Darwin, Charles, Esq., M.A., V.P.R.S. <i>Athenæum Club; and Down, near Bromley, Kent.</i>
1855	Davis, Rev. Nathaniel. 14, <i>Brunswick-square.</i>
1846	Davis, Sir John Francis, Bart., K.C.B., F.R.S. <i>Athenæum Club; and Hollywood, near Bristol, Gloucestershire.</i>
1840	210 *Dawney, the Hon. Payan. <i>Beningborough-hall, Yorkshire.</i>
1830	*Dawson, Lieut.-Col. R. K., R.E. <i>Copyhold Enclosure and Tithe Commission, 3, St. James's-square.</i>
1855	Day, Frederick S., Esq. <i>Nantwich Grammar School, Cheshire.</i>
1852	De Bolnville, Chev. Alexander, K.L.H.
1856	De Cex, William Francis, Esq. 14, <i>Suffolk-street, Pall Mall.</i>
1842	*De Grey, Thomas Philip, Earl, F.S.A., F.R.A.S. 4, <i>St. James's-square; Newby-hall, Boroughbridge; and West-park, Silsby, Beds.</i>
1854	De la Rue, William Frederick, Esq. 108, <i>Bunhill-row.</i>
1834	*Denison, His Excellency Sir William Thomas, Lieut.-Col. R.E., F.R.S. <i>Governor-General of Australia.</i>
1836	Denman, Capt. the Hon. Joseph, R.N. 17, <i>Eaton-terrace; 'Victoria and Albert' Yacht, Portsmouth.</i>
1833	*Derby, Edward Geoffrey, Earl of, P.C., F.L.S. 23, <i>St. James's-square; and Knowsley-park, Prescott, Lancashire.</i>
1837	210 De Ros, Captain the Hon. J. F. Frederick, R.N., F.R.S. 122, <i>Piccadilly.</i>
1854	*Devaux, Alexander, Esq. 2, <i>Avenue-road, Regent's-park.</i>
1852	Devoy, William, Esq., Barrister-at-Law. 5, <i>Waterloo-place; and Woodlands, Burnet, Herts.</i>
1844	Dickinson, Major-Gen. Thomas, Bom. Eng., F.R.A.S. <i>Lower Tulse-hill, Norwood.</i>
1830	*Dickinson, Francis Henry, Esq., F.S.A. 8, <i>Upper Harley-street; and King-Weston-park, Somerset.</i>
1833	Dickinson, John, Esq., F.R.S., F.S.A. <i>Abbott's-hill, Hemel-Hempstead.</i>
1852	Dickinson, John, Esq., jun. 12, <i>Clarence Chambers, Haymarket; and Abbott's-hill, Hemel-Hempstead.</i>
1854	*Dickinson, Sebastian Stewart, Esq., Barrister-at-Law. <i>Brown's-hill, Stroud, Gloucestershire.</i>
1843	Dickson, Peter, Esq., F.S.S. 24, <i>Chater-terrace, Regent's-park.</i>
1836	*Dilke, Charles Wentworth, Esq. 76, <i>Stowe-street.</i>
1845	130 *Dilke, Charles Wentworth, Esq., jun. 76, <i>Stowe-street.</i>
1856	Dillon, the Hon. Arthur. 17, <i>Charges-street.</i>
1840	*Divet, Edward, Esq., M.P. 97, <i>Eaton-square; and Bystock, near Exmouth, Devon.</i>
1854	Dixon, Wm. Hepworth, Esq., F.S.A. <i>Essex Villa, Queen's-road, St. John's-wood.</i>
1841	*Dodd, George, Esq., F.S.A. 9, <i>Grosvenor-place.</i>
1854	Dodson, John George, Esq. 6, <i>Seamore-place, Park-lane.</i>

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- 1854 *Dollond, George, Esq. *St. Paul's Churchyard.*
- 1854 Domville, William T., Esq., R.N., M.D. *H.M.S. 'Agamemnon,' Mediterranean.*
- 1836 Donaldson, Rev. J. W., D.D., F.R.A.S. *Athenarum Club.*
- 1853 Donaldson, Stuart, Esq. *Sydney, Australia.*
- 1854 240 Dunkie, Henry, Esq. 6, *Paragon, Kent-road.*
- 1850 Dover, John William, Esq. 124, *Fenchurch-street.*
- 1850 Douglas, Sir George, Bart. *Springwood-park, Roxburghshire.*
- 1854 Dower, John, Esq. 6, *Cunning-street, Pentonville.*
- 1836 *Downe, Henry William, Viscount, F.L.S. 8, *Belgrave-square; Danby-lodge, Yorkshire; and Bookham-grove, Surrey.*
- 1853 Doyle, Sir Francis Hastings C., Bart. 12, *Great Cumberland-place, Hyde-park.*
- 1845 *Drach, Solomon Moses, Esq., F.R.A.S. 23, *Walpole-street, King's-road, Chelsea.*
- 1849 Draper, George, Esq. 3, *Cambridge-place, Regent's-park.*
- 1846 Drummond, Major-General John. *The Boyce, Dymock, Gloucestershire.*
- 1846 Drury, Commander Byron, R.N. *H.M.S. 'Pandora,' Australian Station.*
- 1851 250 *Du Cane, Captain Francis, R.E. *Turkey.*
- 1851 *Ducis, Henry John, Earl of, F.R.S. *Spring-park, near Stroud, Gloucestershire.*
- 1830 *Duckett, Sir George, Bart., M.A., F.R.S., &c. *Gloucester-lodge, Gloucester-gate, Regent's-park.*
- 1852 Dukinfield, Rev. Sir Henry R., Bart. 33, *Eaton-place; and Stanlake-house, Berks.*
- 1840 *Dundas, Right Hon. Sir David, Q.C. 13, *King's-Bench-walk, Temple; and Ochtertyre, co. Perth.*
- 1830 *Dundas, Rear-Admiral the Hon. Sir Richard Saunders, K.C.B. *Commander-in-Chief, Baltic Fleet.*
- 1850 Dunlop, A. Graham, Esq. 7, *St. Helen's Place; and Wyndham Club.*
- 1837 *Dunraven, Edwin Richard, Earl of, F.R.S. *Adare-moor, Limerick; and Dunraven-castle, Glamorganshire.*
- 1856 Duprat, Chevalier Alfredo. *H.M.F. Arbitrator, Cape Town, Cape of Good Hope.*
- 1852 D'Urban, Colonel W. J. *Deputy Quartermaster-General, Canada.*
- 1844 160 *Ebrington, Hugh, Viscount, M.P. 17, *Bruton-street; and Castle-hill, South Molton, Devon.*
- 1852 Edwards, Henry, Esq. 1, *Bishopsgate-street.*
- 1833 *Edwards, Thomas Grove, Esq. 8, *York-terrace, Regent's-park.*
- 1853 Egerton, Captain the Hon. Francis, R.N. *Bridgewater-house.*
- 1854 Elife, Henri Christopher, Esq. 6, *Brompton-grove.*
- 1845 Ellenborough, Edward, Earl of, G.C.B. 108, *Eaton-square; and Southam-house, near Cheltenham.*
- 1838 *Ellesmere, Francis Egerton, Earl of, K.G., D.C.L., F.S.A., F.R.A.S., &c., &c. *Bridgewater-house, Cleveland-square; Oatlands and Hatchford, Cobham, Surrey; and Worley-hall, Lancashire.*
- 1830 Elliott, Charles, Esq., F.R.S. 47, *Portland-place.*
- 1830 *Elliott, Rev. Charles Bollean, M.A., F.R.S. 47, *Portland-place; and Tattingstone, Suffolk.*
- 1855 †Elliott, Christopher, Esq., M.D. *Colombo, Ceylon.*

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- 1830 170* Elphinstone, the Hon. Mount-Stuart, F.R.A.S. *Athenæum Club; and Waterloo Hotel, Jersey-street.*
- 1830 †Enderby, Charles, Esq., F.R.S., F.L.S. 13, *Great St. Helen's.*
- 1852 Erskine, Captain John Elphinstone, R.N. *H.M.S. 'Orion;' and Cardross, Stirling, N. B.*
- 1850 Espinasse, Capt. J. W., 12th Regt. *East Suffolk; and Mauritius.*
- 1851 Evans, Rev. Charles. *Rugby.*
- 1830 *Evans, Capt. George, R.N. 5, *New-street, Spring-gardens; and Englefield-green, Chertsey.*
- 1830 *Evans, W. Esq.
- 1851 *Evelyn, William J., Esq., M.P., F.S.A. 9, *Bonnett-street, St. James's-street; and Watton-house, near Dorking.*
- 1845 *Everest, Col. Geo., Bengal Art., F.R.S., &c. 10, *Westbourne-street, Hyde-park.*
- 1830 *Everett, James, Esq.
- 1839 180 Ewer, Walter, Esq., F.R.S., F.L.S. 8, *Portland-place.*
- 1856 Eyre, Major Vincent. 30, *Gloucester-place.*
- 1855 Fagan, Lieut.-Col. C. G. *Beaumaris, N. Wales.*
- 1858 Falconer, Thomas, Esq. *Usk, Monmouthshire.*
- 1855 *Fanshawe, Capt. E. G., R.N. *H.M.S. 'Hastings;' & 27, Rutland-gate, Hyde-park.*
- 1854 Farmer, William Francis Gannell, Esq. *Nonsuch-park, Surrey.*
- 1853 *Fayrer, John, Esq., M.D., Hon. F. India Company's Service. *Lucknow.*
- 1838 *Fellows, Sir Charles. 4, *Montagu-place, Russell-square; Cores, Isle of Wight; and Beccles, Nottinghamshire.*
- 1856 Ferguson, William, Esq., F.G.S. 31, *Torrington-square.*
- 1840 *Fergusson, James, Esq., F.R.A.S. 20, *Langham-place.*
- 1830 190 Findlay, Alexander, Esq. 4, *Quality-court, Chancery-lane; and Hayes, Kent.*
- 1844 Findlay, Alex. George, Esq. 4, *Quality-court, Chancery-lane.*
- 1830 *Fittou, Wm. Henry, Esq., M.D., F.R.S., F.L.S. *Athenæum Club.*
- 1830 Fitz-Roy, Capt. Robert, R.N., F.R.S. *Athenæum Club; and 38, Ovaloc-square, Brompton.*
- 1830 Fitzwilliam, Charles William, Esq., F.R.S., F.S.A. *Mortimer-house, Halkin-street; Milton, near Peterborough; and Wentworth-house, near Rotherham, Yorkshire.*
- 1853 *Fleming, Rev. Francis, Sec. to Soc. for Promoting Gospel in Foreign Parts. 79, *Pall Mall.*
- 1847 Forrester, Joseph J., Esq., F.S.A. 24, *Crutched Friars' City; and Oporto.*
- 1839 Forster, Rev. Charles, B.D. *Stated Rectory, Essex.*
- 1845 *Forster, William Edward, Esq.
- 1830 †Forsyth, Commander Charles Codrington, R.N. *H.M.S. 'Hornet,' China Station.*
- 1830 300* Fowler, Robert N., Esq., M.A. 50, *Cornhill; and Tottenham.*
- 1841 *Fowler, Rear-Admiral Robert M. *Walliscote-house, Pangbourne.*
- 1830 *Fox, Lieut.-General Charles R. 1, *Arlison-road, Kensington.*
- 1854 Fox, Sir Charles, C.E., F.R.A.S. 8, *New-street, Spring-gardens; and Farquhar-house, Hornsey-lane, Highgate.*

Year of Election.

- 1854 Fraser, Charles, Esq. 38, *Conduit-street*.
- 1830 Fraser, Major-General John, R.E. *Deputy Quartermaster-General, Ceylon*.
- 1856 Frennattle, Rt. Hon. Sir Thomas F., Bart. 4, *Upper Eccleston-street, Belgrave-square*.
- 1852 French, Dr. James, C.B. *Inspector-General of Hospitals, Edinburgh*.
- 1850 Frere, Bartle J. L., Esq. 45, *Bedford-square*.
- 1839 *Frere, George, Esq., jun. *Cape of Good Hope; and 45, Bedford-square*.
- 1839 310*Frere, Rev. Temple. *Choisters, Westminster*.
- 1842 Frere, William Edw., Esq., F.R.A.S. *Bombay; and 45, Bedford-square*.
- 1830 Freshfield, James William, Esq., M.P., F.R.S. 6, *Devonshire-place, Portland-place; and Manor-place, Betchworth, Surrey*.
- 1853 Frith, John Griffith, Esq. 13, *Wimpole-street; and 11, Austin Friars, City*.
- 1855 Fuller, J., Esq. *Stevens' Hotel, Bond-street*.
- 1855 Gabriel, Edmund, Esq. *H.M.'s Arbitrator, St. Paul de Loudo*.
- 1845 *Gage, Admiral Sir William Hall, G.C.H., K.C.B. *Arthur's Club; and Thurston Cottage, Bury St. Edmund's, Suffolk*.
- 1855 *Galloway, John James, Esq. *Survey Department, Sydney*.
- 1848 *Galton, Capt. Douglas, R.E. 12, *Chester-street, Grosvenor-place*.
- 1850 *Galton, Francis, Esq. 55, *Victoria-street, Westminster; and 5, Bertie-terrace, Leamington*.
- 1854 320*Gammell, Andrew, Esq. 37, *Grosvenor-place; and Drumtochty, Kincardineshire, N.B.*
- 1830 *Garry, Nicholas, Esq., F.H.S. *Esher, near Clarendon, Surrey*.
- 1833 Gascoigne, Capt., Ceylon Rifles. *Athenaeum Club*.
- 1838 *Gawler, Colonel George, K.H. *United Service Club*.
- 1830 *Gibbes, Charles, Esq., M.B.I. 24, *Canendish-square*.
- 1852 Gifford, George, Earl of. 2, *Wilton-street, Grosvenor-place*.
- 1855 Gillespie, Alexander, Esq. *Bilfinger-street, City; and 38, Gordon-square*.
- 1852 Gishorne, Lionel, Esq., C.E. 6, *Duke-street, Adelphi*.
- 1836 Gladlish, William, Esq. *Cliff-cottage, near Gravesend*.
- 1845 *Gladstone, William, Esq. 57½, *Old Broad-street, City*.
- 1854 330 Glen, Joseph, Esq., M.D., Mem. Geogr. Soc. of Bombay. *Oriental Club*.
- 1853 Goderich, George Frederick, Viscount, M.P. 1, *Carlton-gardens*.
- 1830 Goldsmidt, Sir Isaac Lyon, Bart., F.R.S., F.S.A. *Park Lodge, Regent's-park; and The Wick, Brighton*.
- 1856 Gordon, Alexander, Esq., C.E. 22, *Fludyer-street, Whitehall*.
- 1853 Gordon, Captain Robert, R.N. *United Service Club*.
- 1854 Gordon, Harry George, Esq. 1, *Clifton-place, Hyde-park-gardens*.
- 1856 Gordon, James Wilkinson, Esq. 184, *Cambridge-street, Finsbury*.
- 1853 Gore, Montagu, Esq. 20, *South Audley-street*.
- 1853 Gore, Richard Thomas, Esq. 6, *Queen-square, Bath*.
- 1853 Gorman, John, Esq., M.D. *Mark-lane, City; and Port St. Mary, Spain*.
- 1835 340 Gough, Captain Francis A., R.E. 3, *Brynmaston-place*.
- 1846 Gough, John, Esq., F.B.S., F.L.S. 20, *Broad-street, Golden-square*.

Year of Election.	
1830	*Gowen, James Robert, Esq. <i>Treasurer of the Horticultural Society. 1870, Piccadilly.</i>
1854	*Grace, Rear-Admiral Percy. 139, <i>New Bond-street.</i>
1833	*Graham, the Right Hon. Sir James Robert George, Bart., M.P., F.R.S., &c. 46, <i>Grosvenor-place; and Netherby, near Carlisle.</i>
1830	*Graves, Captain Thomas, R.N., F.R.A.S. <i>Malta.</i>
1830	*Gray, John Edw., Esq., Ph. D., F.R.S., V.P.Z.S. and L.S., Pr. B.S. <i>British Museum.</i>
1830	Greene, Thomas, Esq., M.P. 19, <i>Duke-street, Westminster; Slyne, Lancaster; and Whittington-hall, near Burton, Westmoreland.</i>
1853	Grenfell, Riversdale W., Esq. 27, <i>Upper Thames-street.</i>
1830	*Gresswell, Rev. Richard, M.A., F.R.S. <i>Worcester College, Oxford.</i>
1852	350 Greville, Algernon, Esq. <i>Travellers' Club.</i>
1837	*Grey, Sir George, K.C.B. <i>Governor and Commander-in-Chief, Cape of Good Hope. 14, Eaton-place.</i>
1844	*Grey, Ralph William, Esq., M.P. 16, <i>Carlton-house-terrace; and Chipchase-castle, Hexham.</i>
1838	Griffith, George Reelard, Esq. 89, <i>Westbourne-terrace, Hyde-park.</i>
1839	Griffith, John, Esq. 16, <i>Finchbury-place, South.</i>
1836	Griffith, Richard Clewin, Esq. 10, <i>Gower-street.</i>
1855	Grindrod, R. B., Esq., M.D., LL.D., F.L.S., &c. <i>Thornand-house, Malvern.</i>
1830	*Gurney, Hudson, Esq., F.R.S., F.S.A. 9, <i>St. James's-square; and Keswick-hall, near Norwich.</i>
1841	*Haddington, Thomas, Earl of, K.P., F.R.S. 43, <i>Berkeley-square; and Tynning-hame-house, Prestonkirk, Huddingtonshire.</i>
1830	*Halford, the Rev. Thomas, M.A. 2, <i>Hamover-square; Lulcham, Middlesex; and Ontwell, Norfolk.</i>
1853	360 *Halkett, Rev. Dunbar S. <i>Little Bookham, Surrey.</i>
1853	*Halkett, Lieut. Peter A., R.N. 56, <i>Jermyn-street; and Wyndham Club.</i>
1853	Hall, Captain William Hutcheson, R.N., F.R.S. <i>United Service Club; H.M.S. 'Blenheim;' and Shipbourne Lodge, Tunbridge.</i>
1830	Hallam, Henry, Esq., Trust. Brit. Mus., M.A., F.R.S., V.P.S.A., F.R.A.S., M. Fr. Inst. 24, <i>Wilton-crescent; and Pickhurst, Hayes, Kent.</i>
1830	*Hamilton, Capt. Henry G., R.N. 71, <i>Eccleston-square.</i>
1830	Hamilton, Terrick, Esq., F.S.S. 121, <i>Park-street, Grosvenor-square.</i>
1846	Hamilton, Rear-Admiral William Alex. Ballie. 21, <i>New-street, Spring-gardens.</i>
1837	Hamilton, Wm. John, Esq., F.R.S., President G.S. 23, <i>Chesham-place.</i>
1830	*Hamilton, William Richard, Esq., Trust. Brit. Mus., F.R.S., F.S.A., V.P.R.S.L., &c. 12, <i>Bolton-row.</i>
1830	Hammersley, Charles, Esq. 25, <i>Park-crescent, Portland-place.</i>
1853	370 *Hand, Captain George S., R.N. <i>United Service Club; and H.M.S. 'Simpson.'</i>
1837	*Hanmer, Sir John, Bart., M.P., F.R.S. 59, <i>Eaton-place; and Hammer-hall and Bettingfeld-park, Flintshire.</i>
1840	*Harcourt, Egerton, Esq. <i>Athenæum Club; and 5, Carlton-gardens.</i>

Year of
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- 1853 Harcourt, Rear-Admiral Octavius Vernon. 29, *Devonshire-place*, *Portland-place*; and *Swinton-park*, *Bedske*, *Yorkshire*.
- 1854 *Harding, Major-Gen. George Judd, C.B. 21, *Charles-street*, *Woolbourne-terrace*.
- 1854 Hardy, Peter, Esq., F.R.S. 36, *Brownwick-square*.
- 1851 Harrington, Edward J., Esq. *Post Office*, *Andover*, *Hampshire*.
- 1850 *Harriott, Colonel T. G., R. Staff Corps. *Twickenham*.
- 1853 Harris, Captain the Hon. Edw. A. J., R.N. *H.B.M.'s Consul for Chili*.
- 1855 Harris, the Hon. and Rev. C. A. *Woodfield*, *Southampton*.
- 1852 380 Harris, George Frederick, Esq., M.A. *Harrow-park*, *Middlesex*.
- 1847 Harrowby, Dudley, Earl of. 39, *Grosvenor-square*; *Sandon-house*, *Lichfield*; and *Norton*, *Gloucestershire*.
- 1854 *Hartland, Frederick D., Esq. *The Oatlands*, near *Cheltenham*.
- 1846 Harvey, W. S., Esq., R.N. *Omanway and Co.*, *Charing-cross*.
- 1854 Hawkins, Dismet, Esq., M.D., F.R.S., F.S.S. 23, *Great Marlborough-street*; and *West Court*, *Wokingham*, *Berks*.
- 1840 *Hawkins, John, Esq.
- 1850 Hawtrey, Rev. Dr. Edward Craven, D.D., F.S.A. *Eton College*.
- 1852 *Hay, Capt. J. C. Dalrymple, R.N. *H.M.S. 'Hannibal'* 24, *Prince's-gate*, *Hyde-park*, *South*.
- 1850 *Hay, Robert Wm., Esq., F.R.S., F.S.A., &c. *Blechyden-terrace*, *Southampton*.
- 1853 Hayward, Robert Newton, Esq. *Sidney Lodge*, *Morningside*, *Edinburgh*.
- 1857 390 *Henderson, James, Esq. *Littlewood-park*, *Forbes*, *Aberdeenshire*.
- 1853 Henderson, John, Esq. *Volpauino*.
- 1852 Henderson, William, Esq. 5, *Stanhope-street*, *Hyde-park-gardens*.
- 1844 *Henage, Edward, Esq. 61, *Chester-square*, *Pimlico*.
- 1838 *Henry, Wm. Chas., Esq., M.D., F.R.S. *Huffield*, near *Ladbury*, *Herefordshire*.
- 1834 *Herbert, Jacob, Esq. *Trinity-house*, *Tower-hill*.
- 1845 Herbert, Right Hon. Sidney, M.P. 49, *Belgrave-square*; and *Willon-house*, *Wills*.
- 1833 *Herbert, Sir Thomas, M.P., K.C.B., Rear-Admiral. 74, *Canogan-place*; and *Tore Cottage*, *Kilburney*, *Ireland*.
- 1841 Hessay, James Augustus, Esq. 4, *St. Barnabas-terrace*, *Addison-road*, *Kensington*.
- 1840 *Heywood, James, Esq., M.P., F.R.S., F.S.A. *Athenaeum Club*; 5, *Eaton-place*; and *The Headlands*, *Prestwich*, near *Manchester*.
- 1853 400 Hickey, Edwin, Esq. *Sydney*.
- 1850 Hill, Henry, Esq. *Athenaeum Club*; and 61, *York-terrace*, *Regent's-park*.
- 1854 Hill, Lieut.-Colonel Stephen J. *Army and Navy Club*; and *Governor and Commander-in-Chief*, *Gold Coast*.
- 1846 *Hindmarsh, Frederick, Esq. 17, *Bucklersbury*.
- 1846 Hobbs, J. S., Esq. 157, *Lendenhall-street*, *City*.
- 1855 *Hobbs, Wm. Geo. Ed. *Master of Grammar School*, *Ware*, near *Ware*.
- 1850 Hobhouse, Henry William, Esq. 28, *South-street*, *Park-lane*.
- 1834 *Holgkin, Thomas, Esq., M.D. 35, *Bedford-square*.
- 1856 Hogg, James, Esq., Jun. 18, *St. Andrew's Square*, *Edinburgh*.
- 1850 Hogg, John, Esq., M.A., F.R.S., F.L.S., *Foreign Sec. R. Soc. of Literature*, *S. Sergeants' Inn*, *Temple*; and *Norton-house*, *Stockton-upon-Tees*.

Year of Election.	
1839	410* Holford, R. S., Esq. 15, <i>Bolton-street, Piccadilly.</i>
1850	Holland, Sir Henry, Bart., M.D., F.R.S. 25, <i>Lower Brook-street.</i>
1847	Holman, J. Baptiste, Esq. 15, <i>Belford-row, Bloomsbury.</i>
1835	*Holmes, James, Esq. 4, <i>New Ormond-street, Queen-square.</i>
1839	*Holroyd, Arthur Todd, Esq., M.D., F.L.S. <i>Athenæum Club.</i>
1830	*Hooker, Sir Wm. Jackson, K.H., Ph. D., LL.D., F.R.S., F.S.A., F.L.S., &c. <i>West-park, Kent.</i>
1846	*Hope, Alex. James Beresford, Esq. 1, <i>Connaught-place, Hyde-park; and Redgrave-park, Hurst-green, Kent.</i>
1853	Hoskins, George Alex., Esq. 10, <i>Gloucester-square, Hyde-park.</i>
1853	Howard, Sir Ralph, Bart. 17, <i>Belgrave-square; and Bushy-park, Wicklow.</i>
1845	Howse, Joseph, Esq. <i>Cirencester.</i>
1842	420* Hubbard, J. Gellibrand, Esq. 24, <i>Prince's-gate, Hyde-park, South.</i>
1838	Hughes, William, Esq. 13, <i>Paternoster-row.</i>
1838	*Hume, Edmund Kent, Esq.
1851	Hyde, James Bartlett, Esq. <i>Apley, Ryde, Isle of Wight.</i>
1854	1611, Benjamin, Esq. 2, <i>Chaven-hill-gardens, Baywater.</i>
1852	Illingworth, Richard Stonhewer, Esq. 9, <i>Norfolk-crescent, Hyde-park.</i>
1850	*Imray, James, Esq., jun. 102, <i>Minories; and Manor-park, Streatham.</i>
1851	Inglefield, Captain Edward A., R.N., F.R.S. 58, <i>Cambridge-street, Hyde-park; and H.M.S. 'Firebrand,' Mediterranean.</i>
1846	Ingram, Hughes Francis, Esq. <i>University Club; and Foles-court, Mereworth, Maidstone.</i>
1852	Inskip, Rev. Robert Mills. 8, <i>Dona's-place, Plymouth.</i>
1840	430*Irby, Frederick, Esq. <i>Athenæum Club.</i>
1853	Irring, Thomas, Esq. 9, <i>Norland-place, Notting-hill.</i>
1850	Jackson, William, Esq. 47, <i>Exmouth-square.</i>
1855	Jackson, William, Esq., M.P. 25, <i>Cambridge-square, Hyde-park.</i>
1854	Jellicoe, Charles, Esq. 5, <i>Wimpole-street.</i>
1854	Jenkins, Capt. Griffith, L.N. <i>East India Club, St. James's-square.</i>
1837	*Jenkins, R. Castle, Esq.
1853	Jenkyn, Rev. Thomas Williams, D.D., F.G.S. <i>Rochester.</i>
1851	Jensdoga, John, Esq., F.S.S. 20, <i>New Ormond-street, Queen-square.</i>
1854	*Jennings, William, Esq., M.A. 13, <i>Victoria-street, Westminster.</i>
1837	440 Jervis, Lieut.-Col. Thomas Best, E.I.C. Eng., F.R.S., F.L.S. <i>Athenæum Club.</i>
1854	Johnson, John Hugh, Esq. 35, <i>Constitution-street, Leith, Edinburgh.</i>
1843	Johnston, Alex. Keith, Esq., F.R.S.E., Hon. Mem. Berl. Geog. Soc., etc. <i>March-hall-park; and 4, St. Andrew-square, Edinburgh.</i>
1856	Johnston, A. R., Esq. <i>Athenæum Club; and 25, Mount-street.</i>
1853	Johnstone, Sir John Vanden Bempde, Bart., M.P., D.C.L. 27, <i>Grosvenor-square; and Hackness-hall, near Scarborough.</i>
1851	Jones, Major-General Sir Harry David, R.E., R.C.B.
1843	*Jones, William H., Esq., F.R.S. 4, <i>Rupert-street.</i>

Year of
Election.

- 1840 *Kalerigi, John, Esq., M.R.I. 23, *Montagu-square*.
- 1835 Kane, Major Fred. A. C., 15th Regt. Bombay N. I. *Junior United Service Club*.
- 1845 *Ketlett, Commodore Henry, R.N., C.B. *Clonnell, Ireland; and H.M.S. 'Ter-
majant,' North America and West Indies*.
- 1854 450 Kennedy, Rev. John, M.A. 4, *Stepney-green*.
- 1851 †Kent, John, Esq. *Shafston, Moreton Bay, Australia*.
- 1846 Kenyon, John, Esq., F.G.S. 39, *Devonshire-place, Portland-place; and The
Cottage, Wimbledon*.
- 1846 King, Lieut.-Colonel Edward R., 36th Regt. *Zante*.
- 1830 *King, Rr.-Adm. Philip Parker, R.N., F.R.S., F.L.S. *Dunbevet, New South Wales*.
- 1853 Knight, Charles, Esq. 90, *Fleet-street; and 8, Carlton-villas, Maiden-vale*.
- 1849 *Laffan, Capt. Robert Michael, R.E., M.P. *Army and Navy Club; and Otham-
lodge, Kent*.
- 1833 *Laird, McGregor, Esq. 3, *Mincing-lane; and 8, Paragon, Blackheath*.
- 1838 *Lance, John Henry, Esq., F.L.S. *The Cedars, Burlington-lane, Chiswick*.
- 1856 Lansdowne, Henry Marquis of, K.G., D.C.L., F.R.S. *Lansdowne-house, Berkeley-
square; Bowood-park, Wilts; and Richmond-hill, Surrey*.
- 1843 460 *Larcom, Lieut.-Colonel Thomas Aiskew, R.E., F.R.S. *Custom-house, Dublin*.
- 1855 Larochs, William Thomas, Esq. 7, *Bolton-row, May Fair; and Wanstond*.
- 1852 Latham, Robert Gordon, Esq., M.D., F.R.S., &c. 29, *Upper Southwick-street,
Oxford-terrace*.
- 1854 Latrobe, Charles Joseph, Esq. *Athenian Club; and the Mote, Tunbridge*.
- 1854 Laurie, Walter, Esq. 2, *Princes-street, Mansion-house*.
- 1846 *Law, the Hon. Henry Spencer, M.A. 1, *Louder-street; and Ellington-house,
Ramsgate*.
- 1830 Law, William J., Esq. 63, *Upper Seymour-street; 33, Lincoln's-in-fields;
and 5, Sussex-square, Brighton*.
- 1850 Lawrence, Edward B., Esq. 20, *King-street, Portman-square*.
- 1830 *Leake, Colonel William M., LL.D., F.R.S. 50, *Queen-Anne-street*.
- 1853 *Le Breton, Francis, Esq. 21, *Sussex-place, Regent's-park*.
- 1856 470 Lee, Charles, Esq. 41, *Grosvenor-place*.
- 1830 *Lee, John, Esq., LL.D., F.R.S., F.S.A., &c. 5, *College, Doctors'-commons;
and Hartwell-house, near Aylesbury, Bucks*.
- 1839 Lee, Thomas, Esq., M.S.S., M.R.I. 5, *George-yard, Lombard-street; and
Great Barr, Staffordshire*.
- 1833 *Lefevre, John George Shaw, Esq., M.A., F.R.S., Vice-Chancellor of the Uni-
versity of London. 6, *Old Palace-yard*.
- 1853 Lefroy, Lt.-Colonel John Henry, R.A., F.R.S. *War Department, 7, Whitehall-
gardens; and 54, Cambridge-terrace, Hyde-park*.
- 1845 Leigh, John Studdy, Esq. 15, *Westbourne-park-crescent*.
- 1836 Lemon, Sir Charles, Bart., M.P., F.R.S., F.H.S., &c. 46, *Charles-street,
Berkeley-square; and Carclew, near Falmouth, Cornwall*.
- 1855 Leslie, G. F. Esq. 45, *Island-gate, Hyde-park*.
- 1840 *Letts, Thomas, Esq. 8, *Royal Exchange*.

Year of Election.	
1853	Leresque, Peter, Esq., F.S.A. 29, <i>Guildford-street, Russell-square.</i>
1850	480 Levien, Edward, Esq. 121, <i>Gloucester-terrace.</i>
1852	Leycester, Lieut. Edmund M., R.N. <i>H.M.S. 'Laurel,' Portsmouth.</i>
1855	*Lindsay, Wm. S., Esq., M.P. 17, <i>Portland-place.</i>
1852	Locke, Joseph, Esq., M.P., F.R.S. 23, <i>Lowndes-square; and 13, Duke-street, Westminster.</i>
1855	Logie, Sir John S., Surgeon E. I. C. Service. <i>Reckhampton.</i>
1850	Londesborough, Albert Lord, F.R.S., F.S.A. 8, <i>Carlton-house-terrace; and Grimsdon, Tufcuster, Yorkshire.</i>
1830	Long, George, Esq., M.A. 29, <i>St. George's-road, Brighton.</i>
1839	*Long, Lawes Henry, Esq. <i>Hampton-lodge, near Farnham, Surrey.</i>
1847	Longman, Thomas, Esq. <i>Paternoster-row; and 8, Sussex-square, Hyde-park.</i>
1830	Lowry, Joseph Wilson, Esq. <i>Robert-street, Hampstead-road.</i>
1830	490* Lyell, Sir Charles, M.A., LL.D., F.R.S., F.L.S., Hon. M.R.S. Ed. 53, <i>Harley-street, Cavendish-square.</i>
1837	*Lynch, Capt. H. Blasse, C.B., Indian Navy, F.R.A.S. <i>Athenaeum Club.</i>
1830	MacDonnell, John, Esq., F.G.S. 41, <i>Grove-end-road, St. John's-wood.</i>
1854	McDowell, William, Esq. 28, <i>Threadneedle-street, City.</i>
1851	†MacGillivray, John, Esq. <i>H.M.S. 'Pandora,' Australia.</i>
1855	McGregor, Duncan, Esq. <i>Board of Trade; and Athenaeum.</i>
1839	Macintosh, Major-Gen. Alex. Fisher, K.H. <i>Anternony, near Glasgow.</i>
1845	*Macintyre, Patrick, Esq., F.S.A., Off. Assoc. Inst. Act. 8, <i>Waterloo-place, Pall-mall; and 13, Greville-place, Kilburn-priory.</i>
1845	Mackenzie, Right Hon. Holt, F.R.A.S. <i>Athenaeum Club; and 28, Wimpole-street.</i>
1830	Mackillop, James, Esq., F.R.A.S. <i>King's-arms-yard.</i>
1855	500 Mackinnon, Wm. Alex., Esq., M.P., F.R.S. 4, <i>Hyde-park-gardens.</i>
1852	M'Leod, Walter, Esq. <i>Head Master of the Royal Military Asylum, Chelsea.</i>
1855	Maclure, Andrew, Esq. 37, <i>Walbrook, City.</i>
1855	*McClure, Captain Sir Robert J. Le M., R.N. <i>Messrs. Hallett and Co., Great George-street, Westminster.</i>
1855	Macnab, John, Esq. <i>Edinburgh.</i>
1839	M'Neil, Sir John, LL.D. <i>Athenaeum Club; and 28, Rutland-square, Dublin.</i>
1845	Macqueen, James, Esq. 18, <i>Kensington-crescent.</i>
1830	*Magrath, Edward, Esq. <i>Hampstead Heath.</i>
1853	Majendie, Ashhurst, Esq., F.R.S. <i>Hedingham-castle, Essex.</i>
1845	*Major, Richard Henry, Esq. <i>British Museum.</i>
1853	510 Malby, Thomas, Esq. 8, <i>Seinton-street, Gray's-inn-road.</i>
1843	*Malcolm, W. E., Esq. <i>Burnfoot, Langholme, near Carlisle.</i>
1853	*Mallet, Charles, Esq. <i>Audit Office; and Belmont, Hampstead.</i>
1836	*Manchester, James Prince Lee, Bishop of, F.R.S., &c. <i>Sedgley-hall, Manchester.</i>
1856	Mandeville, J. Henry, Esq., late H.M.'s Minister Plenipotentiary at Buenos Ayres. 11, <i>Rutland Gate.</i>
1830	*Mangles, Capt. James, R.N., F.R.S. <i>Fairfield, near Exeter.</i>

Year of
Election.

- 1850 Manning, Frederick, Esq. *Byron-lodge, Leamington.*
- 1850 *Marjoribanks, Edward, Esq. 34, *Wimpole-street.*
- 1854 Markham, Clements Robert, Esq. *Union Club; and 4, Onslow-square, Brompton.*
- 1856 *Markham, Edward, Esq. 45, *Welbeck-street, Cavendish-square.*
- 1854 520 Marshall, James Garth, Esq. 37, *South-street, Grosvenor-square; Headingley, near Leeds, Yorkshire; and Monk Coniston, Ambleside.*
- 1850 *Martin, Rev. Joseph William, LL.B. *Keston, Kent.*
- 1850 Martin, R. Montgomery, Esq. 23, *Gloucester-street, Camden-hill, Kensington.*
- 1850 *Martineau, Joseph, Esq., F.Z.S., F.H.S. *Athenum Club; Basing-park, Alton, Hunts; and Whitbread's Brewery.*
- 1845 *Matheson, Sir James, Bart., M.P., F.R.S. 13, *Cleveland-row; and Achany, Bonar-bridge, Sutherlandshire, &c.*
- 1837 *Maughan, Captain P., Indian Navy, F.R.A.S. 37, *Melville-street, Edinburgh.*
- 1855 †May, Daniel John, Esq., R.N. *H.M.S. 'Calcutta.'*
- 1834 Meek, Sir James, C.B. *Iffracombe, Devon.*
- 1838 Melvill, Philip, Esq., F.R.A.S. *East India House.*
- 1854 Melville, Lieut.-Colonel, Military Secretary to the Bombay Government.
- 1850 530 *Mercier, Francis, Esq., F.S.A. 5, *Hamilton-terrace, St. John's-wood.*
- 1842 *Merivale, Herman, Esq., Under Secretary of State for the Colonies. 26, *Westbourne-terrace.*
- 1854 Methuen, Captain Robert. *Oriental Club; and Ormeau.*
- 1853 *Miller, Captain Thomas, R.N. *Army and Navy Club.*
- 1845 Milne, Alexander, Esq., C.B., Commissioner of Woods and Forests. 29, *St. James's-place.*
- 1849 Milner, Rev. Thomas, M.A. *Albion-house, Loughborough-road, Drixton.*
- 1853 Milnes, Richard Monckton, Esq., M.P. 10, *Upper Brook-street; The Hall, Bowry; and Fryton-hall, Ferribridge, Yorkshire.*
- 1837 *Milton, William Thomas Viscount, M.P., F.Z.S. 4, *Grosvenor-square; and Wentworth-house, Rotherham, Yorkshire.*
- 1851 *Mocatta, Frederick, Esq. 2, *Woburn-place, Russell-square.*
- 1853 Mocatta, George, Esq. *Sydney.*
- 1853 540 Moffatt, George, Esq., M.P. 103, *Eaton-square.*
- 1856 Montagu, Henry Seymour, Esq. *Thurloe-lodge, Larkhall-lane, Clapham.*
- 1842 *Montagu, Major Willoughby, *Clapham-common.*
- 1842 *Monteagle, Thomas Lord, F.R.S., F.S.S. 7, *Park-street, Westminster; and Mount Trenchard, Limerick.*
- 1830 *Montefiore, Sir Moses, Bart., F.R.S. 7, *Grosvenor-gate, Park-lane; and East Clif-lodge, Ramsgate.*
- 1830 *Monteith, Lieut.-General William, E.I.C. Eng., F.R.S., F.S.S. 47, *Gloucester-place, Portman-square; and Oriental Club.*
- 1839 Moody, Lieut.-Colonel R. C., R.E. *Ordnance Office, Chatham.*
- 1854 Moore, Major J. A., F.R.S. 19, *Portland-place.*
- 1853 Moorson, Captain William, R.N. *Army and Navy Club; and H.M.S. 'Leander,' Mediterranean.*
- 1830 *Morison, James, Esq. 57, *Upper Harley-street.*

Year of Election.	
1830	550* Mornay, Aristides Franklin, Esq., F.R.S. <i>Perambuco, Brazil.</i>
1839	* Morris, Charles, Esq. <i>University Club.</i>
1855	Muir, Thomas, Esq. 24, <i>Fork-terrace, Regent's-park.</i>
1830	* Murchison, Sir Roderick Impey, G.C.St.S., M.A., D.C.L., F.R.S., V.P.G.S., and L.S., Director-General of the Geological Survey of Great Britain and Ireland, Trust. Brit. Mus., Hon. Mem. B.S. of Ed., R.I.A., Mem. Acad. St. Petersburg, Berlin, and Copenhagen, Corr. Ins. Fr., etc. etc. 16, <i>Belgrave-square.</i>
1830	* Murdoch, Thomas William Clinton, Esq. 8, <i>Park-street, Westminster; and River-bank, Putney.</i>
1851	Murray, George, Esq. 5, <i>Austin Friars.</i>
1850	* Murray, Capt. the Hon. Henry Anthony, R.N. 40, <i>Albany-chambers, Piccadilly.</i>
1844	* Murray, James, Esq. <i>Foreign Office.</i>
1830	Murray, John, Esq. 50, <i>Albemarle-street; and Newstead, Wimbledon.</i>
1853	Napier, Col. George Thomas Conolly, C.B., Assistant Adjutant-General. <i>Canada.</i>
1856	560 Newman, Thomas Holdsworth, Esq. 14, <i>Arlington-street.</i>
1846	Nicolay, Rev. Ch. Grenfell, Librarian and Prof. of Geography, King's Coll. 8, <i>Groove-end-road, St. John's-wood.</i>
1836	Nicolson, Sir Frederick William Erskine, Bart., Capt. R.N. 14, <i>William-street, Louder-square; and H.M.S. 'Pique,' Pacific.</i>
1854	Norman, Henry, Esq. 11, <i>Henrietta-street, Cavendish-square.</i>
1856	North, F. Esq., M.P. 3, <i>Victoria-st., Westminster; and Hastings-lodge, Hastings.</i>
1830	* Northumberland, Algernon Duke of, Rear-Admiral, K.G., F.R.S., F.S.A., Pres. R.I. <i>Northumberland-house, Charing-cross; Alnwick and Keildon Castles, Northumberland; Werrington-park, Cornwall; Sion-house, Middlesex; and Stanwick-park, Yorkshire.</i>
1855	O'Byrne, Robert, Esq. 9, <i>Adelphi-terrace; and Egremont House, Warwick-crescent, Hyde-park.</i>
1830	Ogle, Admiral Sir Charles, Bart. 64, <i>Eaton-place.</i>
1855	Oliphant, Laurence, Esq. 4, <i>Mount-street, Grosvenor-square.</i>
1853	Oliveira, Benjamin, Esq., M.P., F.R.S. 8, <i>Upper Hyde-park-street.</i>
1845	570* Ommauney, Capt. Erasmus, R.N., F.R.A.S. <i>H.M.S. 'Hawk.'</i>
1838	* Ommauney, H. M., Esq. 40, <i>Charing-cross.</i>
1855	Orr, William S., Esq. 17, <i>Torrington-square.</i>
1856	Osborn, Captain Sherard, R.N., C.B. 11, <i>Porchester-place, Oxford-square.</i>
1853	Osborn, Sir George Robert, Bart. <i>Travellers' Club; and Chickensal-priory, Bedfordshire.</i>
1852	Oswell, William Cotton, Esq. <i>Burlington Hotel, Cork-street.</i>
1855	Otway, Arthur John, Esq., M.P. 22, <i>St. James's-square.</i>
1854	Ouchterlony, James, Esq. <i>Madras.</i>
1844	* Overstone, Samuel Lord, M.A., M.R.I. 2, <i>Carlton-gardens; and Wickham-park, Surrey.</i>
1854	Oxenham, Rev. William, M.A. <i>Harrow, Middlesex.</i>
1846	580* Oxford, Samuel Wilberforce, Bishop of, F.R.S., F.S.A. 26, <i>Pall-mall; Owl-dean Palace, Wheatley, Oxfordshire; and Loxington, Sussex.</i>

Year of
Election.

- 1852 Packman, Fred. W. S., Esq., M.D. 12, *Charyea-street, Piccadilly*; and *Cuyton-hall, Chesterfield, Derbyshire*.
- 1853 Pakington, Right Hon. Sir John Somerset, Bart., M.P., F.R.S. 41, *Eaton-square*; and *Westwood-park, Droitwich, Worcestershire*.
- 1855 Palmer, Captain Edmund, R.A. *Woolwich*.
- 1838 *Palmer, Samuel, Esq.
- 1850 Palmerston, Henry John, Lord Viscount, M.P., G.C.B., F.R.S., &c. 149, *Piccadilly*; and *Broadlands, Bomey, Hants*.
- 1849 *Parish, Lieut. Com. John E., R.N. *H.M.S. 'Sharpshooter,' S.E. Coast of America*.
- 1833 *Parish, Sir Woodbine, K.C.H., F.R.S., &c. *Quarry-house, St. Leonard's-on-Sea*.
- 1852 Parker, J. Walter, Esq., jun. 445, *West Strand*.
- 1830 *Parker, Thomas Lister, Esq., F.R.S., F.S.A. *Tubley-house, Knutsford*.
- 1850 590† Parkes, Harry, Esq. *Oriental Club*; and *China*.
- 1850 *Parkyns, Mansfield, Esq., F.Z.S. *Arthur's Club, St. James's-street*; and *Woodborough-hall, Southwell*.
- 1854 Parr, Thomas Clements, Esq., M.A. 21, *West-mall, Clifton*.
- 1830 *Pasley, Sir Charles William, K.C.B., R.E., F.R.S., Lieut.-Gen. 12, *Norfolk-crescent, Hyde-park*.
- 1854 Paulson, Commander John T., R.N. *Army and Navy Club*.
- 1847 *Paynter, William, Esq., F.R.A.S. 21, *Belgrave-square*; and *Canborne-house, Richmond, Surrey*.
- 1855 Penbody, George, Esq. *Club-chambers, Regent-street*.
- 1853 Peacock, George, Esq. 5, *Craven-hill-gardens, Hyde-park*.
- 1853 *Peckover, Alexander, Esq. *Wisebeach*.
- 1852 Peel, Capt. William, R.N. *Whitehall-gardens*.
- 1846 600* Pelly, Sir John Henry, Bart. *Upton, Essex*.
- 1830 *Penn, Richard, Esq., F.R.S. *Whitehall*.
- 1830 Pepys, William Haseldine, Esq., F.R.S., F.L.S. 11, *Earl's-terrace, Kensington*.
- 1853 Percy, Colonel the Hon. Hugh M. (Guards). 8, *Portman-square*.
- 1846 Petermann, Augustus, Esq., Hon. Memb. Berl. Geog. Soc.
- 1854 Phelps, William, Esq. 18, *Montagu-place, Russell-square*.
- 1843 Phillimore, John George, Esq., Q.C., M.P. 19, *Old-square, Lincoln's-inn*; and 21, *Chester-square*.
- 1830 *Phillips, Sir Thomas, Bart., M.A., F.R.S., F.S.A. *Athenaeum Club*; and *Middle-hill, Broubaey, Worcestershire*.
- 1856 Phillips, John, Esq., Solicitor. *Hastings*.
- 1854 †Phillips, Lieut.-Colonel B. Travell. *Senior United Service Club*.
- 1854 610 Phillips, T. Bacon, Esq. 6, *Oriental-place, Brighton*.
- 1852 Pike, Lieut.-Com. John W., R.N. 26, *Burlington-street*; and *H.M.S. 'Banahoe,' Mediterranean*.
- 1855 Pilkington, James, Esq., M.P. *Reform Club*; and *Blackburn*.
- 1852 *Pim, Lieut. Bedford C. T., R.N. *H.M.S. 'Orion'*.
- 1856 *Ploves, John Henry, Esq. 5, *Endsleigh-street, Tavistock-square*.
- 1834 *Pocock, John Innis, Esq. 19, *Chester-terrace, Regent's-park*; and *Packrup-hall, Twickenbury*.

Year of Election.	
1855	Polluxfen, Capt. J. J. <i>Assistant Quartermaster-General, Bombay Army.</i>
1837	*Pollington, John Charles George, Viscount, F.R.A.S. <i>Meskley-park, near Leeds.</i>
1853	Pollock, Sir George, G.C.B., Lieut.-General. <i>Clapham-common, Surrey.</i>
1835	*Ponsonby, Hon. Frederick G. B. 3, <i>Mount-street, Grosvenor-square.</i>
1853	620 Porter, Edward, Esq. <i>Athenæum Club; and 43, Pall-mall.</i>
1830	*Portlock, Colonel Joseph Ellison, R.E., F.R.S. <i>Woolwich.</i>
1854	Power, John Arthur, Esq., M.A. 52, <i>Barton-crescent.</i>
1854	Power, John, Esq. 25, <i>Sussex-place, Regent's-park; and Panama.</i>
1847	Pruitt, F. T., Esq., D.O.L. 2, <i>College, Doctors'-commons.</i>
1853	Price, Jas., Esq., M.D., F.R.C.S., &c. <i>Gloucester-cottage, Effra-road, Briston.</i>
1852	Price, James Glenie, Esq., Barrister-at-Law. 14, <i>Clement's-lane.</i>
1855	*Pringle, Thomas Young, Esq. 14, <i>Eaton-square.</i>
1845	Prinsep, Henry T., Esq. <i>Little Holland-house, Kensington.</i>
1852	Prout, John William, Esq., M.A., Barrister-at-Law. <i>Newden-house, Willesdon, Middlesex.</i>
1852	630 Pullen, Commander William J. S., R.N. <i>H.M.S. 'Falcon.'</i>
1845	Puller, Christopher William, Esq. <i>Youngsbury, Ware, Herts.</i>
1854	*Quin, Captain Michael, R.N. <i>Senior United Service Club; and 18, Albion-villas, Albion-road, Islington.</i>
1850	Radstock, Granville George, Lord, Vice-Admiral, C.B. 26, <i>Portland-place.</i>
1853	Rae, Dr. John. <i>Hudson Bay Company.</i>
1851	*Ramsay, Capt. William, R.N., F.R.A.S. <i>H.M.S. 'Hogue.' Junior United Service Club; and 23, Ainslie-place, Edinburgh.</i>
1854	Ramsay, Sir James, Bart. <i>University Club; and Barmy-house, Aylth, N.B.</i>
1839	Raper, Henry, Esq., R.N., F.R.A.S. 6, <i>Prince's-terrace, Prince's-gate, Hyde-park.</i>
1848	Ravenshaw, E. J., Esq., M.R.A.S. 39, <i>Conduit-street.</i>
1844	*Rawlinson, Lieut.-Col. Sir Henry Creswicke, C.B., D.C.L., F.R.S. <i>Athenæum Club; and 411, Albany.</i>
1838	640 Rawson, Rawson W., Esq. <i>Canada.</i>
1852	Raymond, Venerable Archdeacon of Durham. <i>Athenæum Club; 16, Cumberland-street; and Durham.</i>
1838	*Reid, Sir William, K.E., K.C.B., Major-Gen. <i>Governor of Malta.</i>
1845	Reidel, James Meadows, Esq., C.E., F.R.S. 8, <i>Great George-street, Westminster; and 10, Kensington-palace-gardens.</i>
1830	*Rennie, George, Esq., C.E., F.R.S., Hon. M.R.I.A. 21, <i>Whitehall-place; and Holmwood-hedge, near Dorking, Surrey.</i>
1834	*Rennie, M. B., Esq., C.E. 21, <i>Whitehall-place.</i>
1830	*Rennie, Sir John, C.E., F.R.S., F.S.A. 5, <i>Spring-gardens.</i>
1830	*Renouard, Rev. George Cecil, B.D., M.E.A.S. <i>Swancombe-rectory, near Dartford.</i>
1830	*Renwick, Lieutenant, R.E.
1853	Reynolds, Joseph, Esq. <i>Club-chambers, Regent-street.</i>
1830	650*Richardson, Sir John, R.N., M.D., C.B., F.R.S., L.S. <i>Harlar-hospital, Gosport.</i>

Year of
Election.

- 1830 *Ripon, Frederick John, Earl of, F.R.S. 1, *Carlton-gardens*; *Nocton, Eleanford, Lincolnshire*; and *Putney-heath, Surrey*.
- 1830 *Robe, Colonel Fred. Holt, C.B. *United Service Club*; and *Woolwich-common*.
- 1853 Robertson, Peter, Esq. (Staff Surgeon, first class). *Army and Navy Club*.
- 1853 †Robinson, Albert, Esq., C.E., F.G.S.
- 1830 *Robinson, Captain Charles G., R.N. *H.M.S. 'Ceylon,' Malta*; and 16, *Southampton-place, Euston-square*.
- 1850 *Robinson, Walter F., Esq., Lieut. R.N. *Junior United Service Club*; and *Queensdown, Cork*.
- 1855 Robinson, Thos. Fleming, Esq., F.L.S. *Gloucester-buildings, Wakeorth*.
- 1856 Roche, Antonia, Esq. *Educational Institute, Cadogan-gardens*.
- 1830 *Rodd, James Rennell, Esq., M.R.I. 40, *Wimpole-street*.
- 1830 660 *Roget, Peter Mark, Esq., M.D., F.R.S., F.L.S., F.G.S., M.R.I.A. 18, *Upper Bedford-place, Russell-square*.
- 1834 *Rose, the Right Hon. Sir George, F.R.S., LL.D. 4, *Hyde-park-gardens*; and 25, *Southampton-buildings, Chancery-lane*.
- 1830 Rose, Charles, Esq. 60, *Portland-place*.
- 1844 *Rouse, William, Earl of, M.A., K.P., Trust. Brit. Mus., F.R.S., F.S.A. *Biercastle, Parsonstown, King's County, Ireland*.
- 1839 *Rous, Rear-Admiral the Hon. Henry John. 23, *Grafton-street, Bond-street*.
- 1856 Rucker, J. Anthony, Esq. *Blackheath*.
- 1830 Rumbold, Charles Edmund, Esq., M.P., F.S.A. *Preston-house, Andover, Hants*.
- 1830 *Russell, Jesse Watts, Esq., D.C.L., F.R.S., S.A., L.S. *Han-hall, Staffordshire*.
- 1830 Russell, Lord John, M.P., F.R.S. 32, *Chesham-place*; *Pembroke-lodge, Richmond*; *Endsleigh-house, Devon*; and *Gart-house, near Callanlar, N.B.*
- 1852 Sabine, Col. Edw., R.A., V.P.R.S., F.R.A.S., &c. &c. 13, *Ashley-place, Victoria-street, Westminster*; and *Woolwich*.
- 1847 670 St. Asaph, Thomas Vowler Short, Bishop of. 22, *Wimpole-street*; and *Palace, St. Asaph*.
- 1840 St. Leger, Anthony Butler, Esq. 10, *Berkeley-square*; and 22, *Baker-street, Portman-square*.
- 1845 *Salomons, the Right Hon. David, Lord Mayor, F.R.A.S. 3, *Great Cumberland-place, Hyde-park*; and *Broom-hill, near Tambridge Wells*.
- 1852 Saumarez, Commander Thomas, R.N. *Green Hill, Barnet*.
- 1838 Scarlett, Major-General the Hon. Sir J. Yorke, K.C.B. *Crinca*.
- 1851 Scarlett, Lieut.-Colonel the Hon. W. F., *Scots Fusilier Guards*.
- 1854 Selater, George, Esq., M.A. 15, *New-street, Spring-gardens*.
- 1855 Scott, Rear-Admiral James. *United Service Club*.
- 1840 *Scrivenor, J. Frederick Pike, Esq. 20, *Bryantow-square*; *Ramridge-house, near Andover, Hants*; and *Sibton-abbey, Yarford, Suffolk*.
- 1830 *Sedgwick, the Rev. A., Hon. M.R.I.A., Woodwardian Lecturer, M.A., F.R.S., F.R.A.S. *Athenaeum Club*; and *Cambridge*.
- 1853 680 Serin, Charles, Esq. 11, *Cutham-street, City*.
- 1853 Sewell, Henry, Esq. 23, *Gresham House, Old Broad-street, City*; and *Stamford-hill*.

Year of Election.	
1853	Seaton, George, Esq., M.D., Ph. Dr. 25, <i>Chester-place, Kennington-cross.</i>
1853	*Seymour, Henry Danby, Esq., M.P. 39, <i>Upper Grosvenor-street; Knoyle-Hindon, Wilts; and Glutonbury, Somersetshire.</i>
1855	Seymour, Sir Geo. F., K.C.B., G.C.H., Vice-Admiral. <i>Portsmouth.</i>
1854	*Shadwell, Captain Charles F. A., R.N., C.B. <i>Army and Navy Club.</i>
1855	Shaw, William Edward, Esq., R.N. 1, <i>James-street, Adelphi.</i>
1846	Sheffield, George Augustus Frederick Charles, Earl of, F.Z.S. 20, <i>Portland-place; and Sheffield-park, Sussex.</i>
1852	Silk, John Alexander, Esq. 1, <i>Brunswick-square; and Southwood-lane, Highgate.</i>
1853	Silver, William, Esq., Barrister-at-Law. <i>Addison-road, Kensington.</i>
1853	690 Simmons, Edward Robert, Esq., Barrister-at-Law. 1, <i>Sergeants' Inn, Chancery-lane.</i>
1848	Simmons, Lt.-Col. John L. A., R.E. <i>Crimes.</i>
1856	Simmons, Nicholas Fenwick, Esq. 5, <i>Hatcham-terrace, New-cross.</i>
1853	Simpkinson, Lieut. Francis G., R.N. 21, <i>Bedford-place, Russell-square.</i>
1855	*Simpson, John, Esq., M.D., R.N. <i>Malta Hospital.</i>
1855	*Smith, Edward Osborne, Esq., F.S.A., &c. 24, <i>Brymston-square.</i>
1853	†Smith, George, Esq. <i>Peru.</i>
1830	*Smith, James, Esq., F.R.S.L. & E. <i>Athenaeum Club; and Jordan-hill, Glasgow.</i>
1854	Smith, John, Esq., Memb. Geograph. Soc., Bombay. <i>Oriental Club.</i>
1853	Smith, John Harrison, Esq. <i>Pocanna; and 9, Upton-park Villas, Slough, Bucks.</i>
1853	700 Smith, John Henry, Esq. <i>Purley, Surrey.</i>
1836	*Smith, Lieut.-Col. James Webber, 95th Regt.
1838	*Smith, Octavius Henry, Esq. <i>Thames-bank Distillery; and Wimbledon-common.</i>
1855	Smith, Rev. Brownrigg, M.A. <i>Shepherd-lane, Brixton.</i>
1830	*Smith, Sir Charles Felix, K.C.B., Lieut.-Gen. 7, <i>Onslow-square, Brompton; and Pendyffryn, Conway, North Wales.</i>
1841	*Smith, Thomas, Esq.
1855	Smith, W. H., Esq., Barrister-at-Law. <i>Barrowfield, Scarsden.</i>
1837	*Smyth, Captain William, R.N. <i>Purkstown, near Poole, Dorset.</i>
1830	*Smyth, Rear-Admiral William Henry, K.S.F., D.C.L., F.R.S., V.P.S.A., F.R.A.S., Hon. M.R.I.A., Corr. Inst. Fr., &c. &c. <i>Athenaeum Club; and St. John's-lodge, near Aylesbury, Bucks.</i>
1850	*Smythe, Lieut.-Colonel William J., R.A. <i>Messrs. Cox and Co., Craig's Court.</i>
1853	710 Solly, Prof. Edward, F.R.S., F.S.A., &c. 15, <i>Tavistock-square; and Parkstone, near Poole.</i>
1839	*Somers, Charles, Earl. <i>Eastnor-castle, Herefordshire; and The Priory, Ricypate, Sussex.</i>
1855	Sopwith, Thomas, Esq., C.E., F.R.S. <i>Allenheads, Haydon-bridge, Newcastle-on-Tyne.</i>
1845	*Sotheby, Lieut.-Col. Frederick Samuel, C.B., F.R.A.S. 3, <i>Portugal-street, Mount-street.</i>
1853	Southey, Henry Sedgfield, Esq., Barrister-at-Law. <i>Athenaeum Club.</i>

Year of
Election.

- 1830 Spencer, Frederick Earl, Rear-Admiral, K.G., C.B., M.R.I. 27, *St. James's-place; and Althorp-park, Northamptonshire.*
- 1830 *Spottiswoode, A., Esq. *New-street-square, Fetter-lane.*
- 1855 *Spottiswoode, William, Esq., F.R.S. 12, *James-street, Buckingham-gate.*
- 1853 Stanford, Edward, Esq. 6, *Charing-cross.*
- 1855 Stanhope, Philip Henry, Earl of, Pres. Soc. of Antiquaries. 41, *Grosvenor-place-houses, Grosvenor-place; and Cheneing, Seven Oaks, Kent.*
- 1853 720*Stanley, Edward Henry, Lord, M.P., D.C.L. 23, *Charles-street, St. James's-square.*
- 1830 *Staunton, Sir George T., Bart., D.C.L., F.R.S., F.S.A. 17, *Devonshire-street, Portland-place; Clydagh-house, Galway; and Leigh-park, Hacont, Hamts.*
- 1836 Staveley, Thomas, Esq. (Foreign Office). 20, *Earls-terrace, Kensington.*
- 1850 Steele, Colonel Thomas M., C.B., Coldstream Guards. 21, *Upper Brook-street.*
- 1830 *Stephen, Sir George. *Prince's Risborough, Bucks.*
- 1855 *Stephenson, Robert, Esq., M.P., F.R.S. 24, *Great George-street, Westminster; and 34, Gloucester-square, Hyde-park.*
- 1854 Stevens, Frederic Perkins, Esq. *Melbourne, Australia.*
- 1855 Stevens, Henry, Esq., F.S.A. *Vernon-house, Camden-square.*
- 1841 Stevenson, Thomas, Esq., F.S.A. 37, *Upper Grosvenor-street.*
- 1845 *Stokes, Capt. John Lort, R.N. 53, *Welbeck-street.*
- 1852 730 Strachey, Capt. Henry, Bengal Inf. *Bengal.*
- 1851 Strachey, Capt. Rich., Bengal Eng. *Bengal.*
- 1853 Stronsberg, Bethel Henry, Esq.
- 1853 Strutt, George H., Esq., F.R.A.S. *Milford, near Derby.*
- 1853 *Strzelecki, Count P. E. de, C.B., F.R.S. 206, *Stville-row.*
- 1834 *Sturge, Thomas, Esq. *Northfleet, Kent.*
- 1833 Sturt, Capt. Charles, F.L.S. *St. Edmund's, Ticoli, Cheltenham.*
- 1853 Stutfield, William, Esq. 15, *Leinster-terrace, Westbourne-terrace.*
- 1853 †Sutherland, Peter C., Esq., M.D. *Natal.*
- 1840 *Sutherland, Robert, Esq.
- 1836 740*Swinhurne, Capt. Charles H., R.N. 19, *Grosvenor-place; and Orpington, near Newcastle-upon-Tyne.*
- 1851 Sykes, Colonel William Henry, Chairman of the Hon. E. I. Company, F.R.S., Hon. M.R.I.A. 47, *Albion-street, Hyde-park.*
- 1852 Syngé, Captain Millington H., R.E. *West Indies.*
- 1852 Tagart, Courtenay, Esq. *Reform Club; and Paris.*
- 1854 *Taylor, John Stopford, Esq., M.D. 23, *Springfield, St. Anne-street, Liverpool.*
- 1830 *Taylor, Richard, Esq., F.S.A., F.L.S., &c. *Red Lion-court, Fleet-street.*
- 1855 Tennent, Sir J. Emerson, K.C.S. *Secretary to the Board of Trade; 63, Warwick-square, Pimlico; and Tenbo-house, Co. Fermanagh, Ireland.*
- 1855 Tennent, Wm. W. Emerson, Esq. 66, *Warwick-square, Pimlico.*
- 1830 *Thatcher, Colonel, E.I.C.
- 1854 Thomas, Henry Harrington, Esq. *Lonsdowne-crescent, Bath.*

Year of Election.	
1854	750 Thomas, James, Esq. <i>Lillingdon-park, Amptwell, Beds.</i>
1854	Thompson, William C., Esq. 25, <i>Halfmoon-street, Piccadilly.</i>
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FAC-SIMILE di una Carta idrografica di Andrea Bianco del 1496, esistente nella Marciana pubblicato per la 1^a volta dal Conte F. Miniscalchi Erizzo. 1853.

The AUTHOR.

DER Arktische Archipel, nach den neuesten Entdeckungen der Franklin Expeditionen. Bearbeitet u. gez. von H. Lange. Berlin.

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DE ZUID Kust van Nieuw Holland, van het Edel's Land tot Port Macquarie en de Solitary Eilanden; Volgens de Laatste Waarnemingen te Zamengesteld; door Jacob Swart. 2 Sheets. Amsterdam, 1854.

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PLAN of Town and part of the Settlement of New Plymouth, New Zealand, selected, surveyed, and delineated by Fred. A. Carrington, late Chief Surveyor of Settlement.

PLAN of Mauh-Kori Pah, a native fortification, and part of the surrounding Settlement, New Plymouth, New Zealand, surveyed and drawn by Fred. A. Carrington, between the years 1840-46.

The AUTHOR.

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JOHNSTON'S Map of the Black Sea, with the adjacent Countries, including portion of Turkey in Asia, Caucasus, Crimea, &c. 1854.

The AUTHOR.

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(Those marked † were lent to the late Dr. E. J. Irving, F.R.G.S., at Alcockaba.)

No.	No.
1. Box Chronometer, by Harrand and Land	825
†2. Box do., by Do. (Exchanged for a Pocket Chronometer, and lent to Dr. Irving)	555
3. Box do., by Molyneux	2482
*4. Pocket do., by Brockbank and Atkins	535
*5. Portable Altitude and Azimuth Instrument, by Robinson.	
6. Six-inch Reflecting and Repeating Circle.	
7. Ebony and Brass Clinometer, by Thomas Jones.	
8. Case of Mathematical and Drawing Instruments.	
9. Case of Surgical Instruments.	
10. Brass Triangular Graduated Chartometer, by Eitel.	
11. Brass Box Pocket Compass, 2½-inch needle.	
12. Large Brass Pantagraph, by Troughton.	
13. Small do., by Blasler.	
14. Set of Graduated Box Scales, by Troughton and Simms.	
15. Bulb Hygrometer for Ether, by W. and S. Jones.	
*16. Brass Sextant (7½-inch), with Silver Limb, by Troughton and Simms.	
17. Do. divided on gold, by Dollond.	
18. Tripod Brass Stand and Counterpoises for Sextant.	
19. Ebony Sextant, with Ivory Limb, 9-inch.	
20. An 8-inch Box Azimuth Compass, with Sight Vanes and Cards in a separate box.	
*21. Strong-framed Artificial Horizon, by Troughton and Simms.	
22. Theodolite (3-inch), divided on Silver, with Mahogany Stand, by Troughton and Simms.	
23. Small Medicine Chest.	
24. Brass Station Pointer, with Lengtheners, by Troughton and Simms.	
*25. Prismatic Pocket Compass, by Troughton and Simms.	
26. Marine Barometer, by Troughton and Simms.	
*27. Thermometrical Boiling Water Apparatus, for Heights.	
28. Case of Wooden Ruling Scales.	
29. Achromatic Telescope (14 feet), 2 inches aperture.	
30. Sliding Tube Do. (3 feet), 14 inches aperture.	
31. Night, or Comet-Sweeping Telescope, 2 feet focus, and 5 inches aperture.	
32. Set of Magnets.	
†32. Mountain Barometer, by Troughton and Simms.	
*34. Two Newman's Improved Iron Cistern Mountain Barometers.	
35. Another ditto.	
36. Square-framed Mountain Barometer, by Newman.	
37. Mountain Barometer, by Troughton and Simms, with Tripod Stand.	
38. Dipping Instrument.	
39. Telescope.	
40 and 41. Two Compasses.	Lent to the late Mr. Duncan, Vice-Consul at Whydah, in 1843, and not returned.
42. Aneroid Barometer,	

Proceedings of the Royal Geographical Society of London.

SESSION 1854-55.

First Ordinary Meeting, November 13, 1854.

REAR-ADMIRAL LORD COLCHESTER, Vice-President, in the Chair.

George Clowes, Esq.; William Clowes, Esq.; Harry G. Gordon, Esq.; Lieut.-Colonel Stephen J. Hill; Charles Jellicoe, Esq.; James G. Marshall, Esq.; Major J. A. Moore, F.R.S.; and Henry H. Thomas, Esq., were elected Fellows.

The Paper read was—

Dr. Rae, M.D., F.R.G.S., "Late Arctic Explorations." A discussion then ensued, in which Capt. Kellett, Col. Sabine, Dr. Scoresby, Sir John Ross, Capt. McClure, Capt. Inglefield, Commr. Osburne, Lieut. Pim, and Mr. P. L. Simmonds took part.

On the table were exhibited the Relics of the Franklin Expedition, which had been purchased from the Esquimaux by Dr. Rae, and also a Model of a Travelling Party in the Arctic Regions by Lieut. Pim, R.N., F.R.G.S.

Second Ordinary Meeting, November 27, 1854.

WILLIAM J. HAMILTON, Esq., F.R.S., in the Chair.

J. S. Ancona, Esq.; Henry Christy, Esq.; W. Heyworth Dixon, Esq.; W. T. Downie, Esq., M.D.; Sir Charles Fox; William H. Garrett, Esq.; Capt. Griffith Jenkins, L.S.; Charles J. Latrobe, Esq.; Clements R. Markham, Esq.; Lieut. J. J. Pollock, Esq.; James Thomas, Esq.; Henry Thorold, Esq.; F. E. Wilkinson, Esq.; and R. D. Woodfield, Esq., were elected Fellows.

The Papers read were—

1. Late Explorations in South Africa, with Route from Wallfisch Bay to the Lake, and Ascent of the Tiogo River, by C. J. Andersson, Esq.

2. Despatches from the Foreign Office, enclosing accounts of the Niger-Chadda Expedition, from Commr. Miller, R.N., Dr. Baikie, and Mr. McGregor Laird.

3. Despatches from Commodore Adams and Commander Philips to the Admiralty, announcing the arrival at Loanda of Dr. Livingston, with remarks on the same by Lieut. Bedingfield, R.N., F.R.G.S.

Third Ordinary Meeting, December 11, 1854.

THE EARL OF SHEFFIELD in the Chair.

The Hon. F. Byron; Alexander Devaux, Esq.; Joseph Glen, Esq.; Commander John T. Paulson, R.N.; F. P. Stevens, Esq.; and Matthew Uzielli, Esq., were elected Fellows.

The Papers read were—

1. Reports from Dr. Barth, addressed to the Chevalier Bunsen, dated Timbuctu, Nov. 23, 1853, and March 23, 1854, announcing his departure from that place. Communicated by the Foreign Office.
2. Despatches from Lieut.-Col. Herman, H. M.'s Consul, dated Tripoli, Oct. 3 and 24, and Nov. 6, 1854, reporting that the African Mission had not yet returned to Kuka from the South, and announcing the death of Mr. Henry Warrington. Communicated by the Earl of Clarendon, K.G.

Fourth Ordinary Meeting, January 8, 1855.

Professor WILLIAM WHEWELL in the Chair.

Thomas Muir, Esq., was elected a Fellow.

The Papers read were—

1. Geographical Notes taken during a Journey performed in Persia, by Keith E. Abbott, Esq., H. M.'s Consul at Tehrân. Communicated by the Earl of Clarendon. *First Part.*
2. Despatch from Dr. Livingston, containing his Routes from Lake Ngami through the interior of S. Africa to Angola. Communicated by Sir Roderick I. Murchison.
3. Despatch from Col. Herman, H. M.'s Consul at Tripoli, respecting the Central African Mission.

Fifth Ordinary Meeting, January 22, 1855.

The President, the EARL of ELLESMERE, in the Chair.

Lieut. Norman B. Beddingfield, R.N.; the Hon. F. H. W. Gough Calthorpe; Vice-Admiral Sir George F. Seymour, K.C.B., &c.; Sir Emerson Tennent; and Lewis H. J. Tonna, Esq., were elected Fellows.

The Papers read were—

1. Geographical Notes taken during a Journey performed in Persia, from the City of Kerman to Khubbes, and through the Southern Districts of the Country to Shiraz, by Keith E. Abbott, Esq., H. M.'s Consul at Tehrân. Communicated through the Earl of Clarendon. *Second Part.*
2. Proposed Expedition to the Somali Country in Eastern Africa, by Lieut. R. Burton.

Sixth Ordinary Meeting, February 12, 1855.

Rear-Admiral BEECHEY, F.R.S., in the Chair.

Frederick S. Day, Esq., and Dr. R. B. Grindrod, were elected Fellows.

Admiral Smyth, E. Osborne Smith, and T. H. Brooking, Esqrs. were appointed Auditors for the Year.

The Chairman directed the attention of the Meeting to the Illustrations by Dr. Baikie and Mr. May, R.N., of the Chadda and Country adjoining; to the Drawings of Mr. M'Gregor Laird's Screw-Steamer, the 'Pleiad,' to the Map

by Mr. Andersson, showing his Route in S. Africa; to some Specimens of the Gold Manufacture of Timbuctu, exhibited by Mr. Renshaw; and to several Maps by Mr. Arrowsmith, to accompany the forthcoming Volume of the Society's Journal.

The Papers read were—

1. On the Sources of the Purus, a great Tributary of the Amazon. By Clements R. Markham, Esq., F.R.G.S.
2. Report on the Arrival of the Chadda Expedition under Dr. Baikie, R.N. Communicated by the Earl of Clarendon, K.G., F.R.G.S.
3. Accounts from the Central African Expedition under Dr. Vogel. Communicated by the Earl of Clarendon, K.G., F.R.G.S.

Seventh Ordinary Meeting, February 26, 1855.

E. OSBORNE SMITH, Esq., in the Chair.

Charles Bovet, Esq.; the Rev. W. B. Clarke, M.A.; John Macnab, Esq.; A. John Otway, Esq., M.P.; William H. Smith, Esq.; Henry Stevens, Esq.; and W. William Emerson Tennent, Esq., were elected Fellows.

The Papers read were—

1. Letter from A. R. Wallace, Esq., F.R.G.S., the late explorer of the Rio Negro, to Dr. Shaw, dated Sarawak, Nov. 1854, giving an account of Singapore and Malacca, as far as Mount Ophir, on his way to Borneo.
2. Meteorological Observations made during a passage from London to Algoa Bay, by Dr. P. C. Sutherland, F.R.G.S.
3. Extracts of a Letter from the Rev. Dr. Rebmann to the Secretary of the Church Missionary Society, dated Kisuludini, in Rabbai, S.E. Africa.
4. On the Coast Survey of South Africa, by Thomas Maclear, Esq., H. M.'s Astronomer at the Cape of Good Hope. Communicated by the late Sir George Cathcart.
5. Notice on the Departure of Mr. Thomas Baines (the Artist) and Mr. J. S. Wilson (the Geologist) of the North Australian Expedition, in the Royal Mail Ship 'Blue Jacket.'

Eighth Ordinary Meeting, March 12, 1855.

SIR RODERICK I. MURCHISON, Vice-President, in the Chair.

J. James Galloway, Esq.; Sir John Login; Andrew MacLure, Esq.; and James Pilkington, Esq., M.P., were elected Fellows.

The Papers read were—

1. Journey from El-Medina to Mecca, down the "Darb-el-Sharki," on the Eastern Road (hitherto unvisited by Europeans), by Lieut. Richard F. Burton.
2. Memoranda on Abyssinia. Communicated by the Foreign Office.
3. Account of a Tour up the Gambia to Salom, by J. Smyth O'Connor, Esq., Governor. Communicated by the Colonial Office.

Ninth Ordinary Meeting, March 26, 1855.

The President, the EARL of ELLESMERE, K.G., in the Chair.

Richard Edward Arden, Esq., and Laurence Oliphant, Esq., were elected Fellows.

The Papers read were—

1. Extract of a Letter received by Admiral Smyth from Admiral Mathieu, on the progress of the Survey in the Straits of Gibraltar.
2. Traces of Leichhardt's Expedition in Australia, and rumours of the existence of Mr. B. Boyd on the Island of Guadalcanar. Communicated by Capt. P. P. King, R.N., F.R.G.S.
3. Report on a Group of Islands seen in the Southern Ocean, by Capt. J. S. Hutton, commanding the Merchant Ship 'Earl of Eglington' of Glasgow. Communicated by J. G. Frith, Esq., F.R.G.S.
4. Despatch from Loanda, respecting Dr. Livingston's Exploration of Central Africa. Communicated by Consul Brand.

Tenth Ordinary Meeting, April 23, 1855.

The President, the EARL of ELLESMERE, K.G., in the Chair.

Viscount Brackley; the Hon. and Rev. C. Harris; Daniel John May, Esq., R.N.; Capt. R. Le M. McClure, R.N.; Dr. W. B. Baikie, R.N.; Robert O'Byrne, Esq.; and Thomas F. Robinson, Esq., were elected Fellows.

The President directed the attention of the Fellows to a number of beautiful Sketches, bequeathed to the Society by the late Dr. Kirk, of the Bombay Army, made when engaged on the Survey of the Red Sea, and when attached to the Mission under Sir William Harris to the Court of Shoa in Southern Abyssinia; and also to an Atlas, by M. Jomard of Paris, entitled "*Les Monumens de la Géographie*," &c., exhibited by Messrs. Williams and Norgate.

Sir Roderick Murchison explained the cause of the delay in the erection of the Monument to the memory of Lieut. Bellot, which he said arose from the difficulty in procuring sufficiently large blocks of granite for the purpose. He next exhibited the drawing of the Obelisk intended to be raised on the Quay at Greenwich, which he stated would be 32 feet high, and 4 feet at its base. Sir Roderick, regretting that the Monument had not been completed, more especially on account of the recent visit of the Emperor and Empress of France, was glad to announce that, after paying the cost of its erection, a surplus of about 1500*l.* would be left for the provision of the five sisters of the gallant Frenchman, a portion of which had already been devoted to that object.

The Papers read were—

1. "Commercial Notes on the State of California," by G. Aikin, Esq., H. M.'s Consul at San Francisco.
2. Letter addressed by Dr. Vogel to Consul Herman, dated Kuka, Sept. 15, 1854; and,
3. Letter addressed by Dr. Barth, dated Kano, Nov. 1854, to Vice-Consul Gagliuffi. Communicated by the Earl of Clarendon, K.G.
4. Letter from Lieut. Barton, addressed to the Secretary, from Aden, announcing his return from Horrur in Abyssinia.
5. Account of the late Earthquake at Brussa, by Consul Sandison. Communicated by the Earl of Clarendon, K.G.

Eleventh Ordinary Meeting, May 14, 1855.

Sir RODERICK I. MURCHISON, Vice-President, in the Chair.

Professor H. W. Acland, M.D.; W. H. G. Kingston, Esq.; Thomas Sopwith, Esq.; and Capt. James Wood, R.N., were elected Fellows.

The Chairman, in the absence, from indisposition, of the President, the Earl of Ellesmere, announced to the Meeting that the Geographical Society of Paris had very courteously transmitted to the Council, through its Vice-President, M. de la Roquette, three Medals for presentation to three Fellows of this Society, to whom they had been awarded by the French Geographers. To Capt. R. McClure, R.N., the Gold Medal had been awarded for his discovery of the North-West Passage; to Capt. Inglefield, R.N., a Silver Medal had been awarded for his discoveries in the Arctic Regions; and to Mr. Francis Galton a Silver Medal had been awarded for his explorations in the Namaqua, Damara, and Ovampo countries, northward of the Orange River, in South-Western Africa.

The Papers read were—

1. Notes on the Passage of Hannibal across the Alps; and on the Valley of Beaufort, in Upper Savoy. By Prof. Paul Chaix, of Geneva, Corresp. F.R.G.S.

2. On the Frontier Tribes of the Punjab, west of the Indus, with a Sketch Map, by Lieut. James Sykes, 2nd Regiment Punjab Infantry. Communicated by Col. Sykes.

3. Copies of Letters from Drs. Barth and Vogel, respecting the progress of the Central African Mission.

Attention was directed to the 24th Vol. of the Journal, recently published; and in adjourning the Meeting to the 28th inst., the Chairman remarked that the Anniversary of the Society would on that day be held at 1 p.m., when the President would deliver his Address on the "Progress of Geographical Discovery" during the past Year; and in the Evening the usual Anniversary Dinner would take place at Willis's Rooms, at 7 p.m.

ANNIVERSARY MEETING, 1 P.M., MAY 28, 1855.

The President, the EARL of ELLESMERE, K.G., in the Chair.

The Minutes of the previous Meeting were read and confirmed. The Regulations respecting the Anniversary Meetings were next read, when the President appointed John Brown and Frederick Hindmarsh, Esqrs., Scrutineers for the Ballot.

William T. Baker, Esq., Lieut. Brit. Lgt. Infantry; John Chapman, Esq.; and Charles Edmonstone, Esq., were proposed as Candidates for Election at the next Meeting.

The Report of the Council, with the Balance-sheet for 1854, and the Estimate for 1855, was then read and adopted, with the additional clause to the Rules and Regulations contained in Act 6 and 7 Victoria, c. 36, viz. "That the Society shall not and may not make any dividend, gift, division, or bonus in money unto or between any of its Members."

The President next delivered the Patron's Gold Medal to the Rev. Dr. Tidman, Secretary to the London Missionary Society, as the representative of the Rev. Dr. Livingston, for his Explorations in Africa, between Lake Ngami and the Portuguese settlements on the West Coast; and a Testimonial of the value of Twenty-five Guineas in Surveying Instruments, bearing a suitable inscription, to Mr. Charles John Andersson, for his Travels in South-Western Africa, as laid down in his Route-Map, communicated to the Society. The Anniversary Address having been read, a unanimous Vote of Thanks was passed, with a request that the President would allow the Address to be printed.

The Ballot being concluded, the Scrutineers reported that the changes advised by the Council had been adopted, and the President accordingly announced that the following gentlemen were elected to fill the vacancies in the Council:—

President.—Rear-Admiral F. W. BEECHY, F.R.S., &c. &c.

Vice-Presidents.—Sir GEORGE BACK, B.N., D.C.L., F.R.S.; the EARL of ELLESMERE, K.G., D.C.L., F.S.A., F.R.A.S., &c. &c.; Sir RODERICK I. MURCHISON, G.C.ST.S., M.A., D.C.L., F.R.S., &c., &c.; Rear-Admiral W. H. SMYTH, K.S.F., D.G.L., F.R.S., &c. &c.

Treasurer.—ROBERT BIDDULPH, Esq.

Trustees.—Sir GEO. T. STAUNTON, Bart., F.R.S.; W. R. HAMILTON, Esq., F.R.S.

Honorary Secretaries.—Sir WALTER C. TREVELYAN, Bart., M.A., and THOMAS HODGKIN, Esq., M.D., &c.

Council.—JOHN ARROWSMITH, Esq.; R.-Admiral Sir F. BEAUFORT, K.C.B., F.R.S.; THOMAS H. BROOKING, Esq.; Col. G. EVEREST, F.R.S.; FRANCIS GALTON, Esq.; W. J. HAMILTON, Esq., F.R.S., Pres. G.S.; Lt.-Col. J. H. LEFROY, R.A., F.R.S.; RICHARD MONCKTON MILNES, Esq., M.P.; W. COTTON OSWELL, Esq.; LORD OVERSTONE, M.A.; Col. J. E. PORTLOCK, R.E., F.R.S.; the EARL of SHEFFIELD; E. OSBORNE SMITH, Esq., F.S.A.; the EARL SOMERS; LORD STANLEY, M.P., D.C.L.; THOMAS STAVELEY, Esq. (Foreign Office); Count P. E. de STRZELECKI, C.B., F.R.S.; Col. W. H. SYKES, F.R.S.

The thanks of the Meeting having been voted to the retiring *President, Vice-Presidents, Members of the Council, Auditors, and Scrutineers*, the President finally directed the attention of the Meeting to the usual Anniversary Dinner, and the Meeting adjourned at 4 p.m.

Twelfth Ordinary Meeting, June 11, 1855.

Sir GEORGE BACK, B.N., Vice-President, in the Chair.

William T. Baker, Esq., Lt. Brit. Lgt. Infantry; John Chapman, Esq.; Rev. N. Davis; Charles Edmonstone, Esq.; William S. Lindsay, Esq., M.P.; W. S. Orr, Esq.; and R.-Admiral James Scott, were elected Fellows.

The Papers read were—

1. Narrative of a Trip to Harar, in the Somali Country, North-Eastern Horn of Africa, by Lieut. R. Burton, Bombay Army.

2. On the Coal Formation of the Province of Concepcion, in Chile, S. America; and,

3. On the Meteoric Iron of Atacama, by William Bollaert, Esq., F.R.G.S.

On the table was exhibited an interesting collection of articles brought home by Mr. Bollaert, who had recently returned from S. America, including specimens of the strata, coal, and fossils, from the coal-fields of Loto in Chile; also of the first fossil bones discovered in Chile, and a fine collection of ancient Peruvian pottery and antiquarian remains of textile fabrics, ornaments, utensils, weapons, &c.; likewise specimens of meteoric iron found in various parts of the Desert of Atacama.

Thirteenth Ordinary Meeting, June 25, 1855.

Sir ROBERT I. MURCHISON, Vice-President, in the Chair.

W. G. B. Hobbs, Esq.; W. Jackson, Esq., M.P.; Major F. Kane; W. A. Mackinnon, Esq., M.P.; T. Y. Pringle, Esq.; Dr. John Simpson, M.D., R.S.; and Earl Stanhope, were elected Fellows.

An interesting collection of Geological specimens, brought by Capt. Collinson from the Arctic Regions, was exhibited on the Table; and a series of beautiful Sketches of the Sandwich Islands, &c., by Mr. Sawkins, was likewise displayed.

The Papers read were—

1. On the Volcanic Mountains of Hawaii, Sandwich Islands, by J. G. Sawkins, Esq. Communicated by Sir R. I. Murchison, V.F.R.G.S.

2. Capt. Collinson, R.N., on the Geographical Results of his late researches in the Arctic Regions.

MISCELLANEOUS.

Twenty-fifth Meeting of the British Association for the Advancement of Science, held at Glasgow, September 12th to 20th, 1855.

(Section E, Geography and Ethnology.)

President.—Sir JOHN RICHARDSON, M.D., F.R.S., F.R.G.S.

Vice-Presidents.—Admiral BEECHY, Pres. R.G.S.; A. K. JOHNSTON, F.R.G.S.; Sir R. I. MURCHISON; General Sir CHARLES PASLEY.

Secretaries.—NORTON SHAW, M.D., Sec. Royal Geograph. Soc.; RICHARD CULL, Hon. Sec. Ethnol. Soc.; W. G. BLACKIE, PH. D., F.R.G.S.

Committee.—Capt. ALLEN, R.N., F.R.G.S.; Sir E. BELCHER, R.N., C.B., F.R.G.S.; Dr. BISHOP, F.R.G.S.; Consul BRAND, F.R.G.S.; JOHN BROWN, F.R.G.S.; Prince LUCIEN BONAPARTE; W. CAMPS, M.D.; Captain COLLINSON, R.N., F.R.G.S.; CHARLES DARWIN, F.R.G.S.; Professor MILNE EDWARDS; ALEXANDER J. ELLIS, B.A.; WILLIAM EWING; Rev. JOHN GEMMEL, M.A.; the EARL of HARROWBY, F.R.G.S.; F. HINDMARSH, F.R.G.S.; Dr. HUME; Dr. JOHN LEE, F.R.G.S.; the LORD PROVOST of Glasgow; JAMES M'CLELLAND; JOHN MACNAB, F.R.G.S.; JOSEPH MAYER; R. MONCKTON MILNES, M.P., F.R.G.S.; Dr. OPPERT, of Paris; Consul HARRY PARKES, F.R.G.S.; ALEX-

ANDER PECKOVER, F.R.G.S.; SIR JAMES RAMSAY, Bart., F.R.G.S.; Professor W. RAMSAY; Colonel RAWLINSON, F.R.G.S.; GEORGE RENNIE, F.R.G.S.; Professor RETZIUS; Staff-Surgeon P. ROBERTSON, F.R.G.S.; Colonel SABINE, F.R.G.S.; Rev. Dr. SCORESBY; JAMES SMITH of Jordan Hill, F.R.G.S.; JOHN SMITH of Bombay, F.R.G.S.; J. J. STANTON; Colonel SYKES, F.R.G.S.; JOHN KING WATTS, F.R.G.S.; Dr. WHEWELL, F.R.G.S.; THOMAS WRIGHT, M.A.; J. B. YATES, F.R.G.S.

1. *Dr. W. Balfour Baikie*, R.N., F.R.G.S.—Report of the late Expedition up the Niger and Chadra Rivers.

2. *Richard Cull*.—On some Water-Colour Portraits of Natives of Van Diemen's Land.

3. *Dr. Barth*.—Description of Timbuctù, its Population, Commerce, &c.

4. *George Frere, Esq.*, F.R.G.S.—Despatch to the Earl of Clarendon, relating to Mr. C. J. Andersson's Journey to Lake Ngami.

5. *C. J. Andersson*.—Late Explorations in Africa.

6. *Rev. Francis Fleming*, M.A., F.R.G.S.—Journey across the Rivers of British Kaffraria.

7. *J. B. Davis*, F.S.A.—On the Skulls of the Ancient Romans.

8. *Rev. John Gemmel*, M.A.—On the Decyphering of Inscriptions on two Seals found by Mr. Layard at Koyunjik.

9. *Dr. Julius Oppert*.—On the Results of the French Scientific Expedition to Babylon.

10. *Professor Retzius of Stockholm*.—On Celtic, Slavie, and Aztec Crania.

11. *Col. Sykes*, F.R.S., F.R.G.S.—On the Survey of the Himalayan Mountains, by Messrs. Schlagintweit.

12. *Sir B. F. Outram*, C.B., F.R.G.S.—Hartlepool Pier and Port as a Harbour of Refuge.

13. *Lieut. Burton, Bombay Army*.—An Account of a Visit to Medina from Suez, by way of Jumbo.

14. *Joseph Boult, Esq.*—On Periodical Engineering Surveys of Tidal Harbours, illustrated by a Comparison of the Surveys of the River Mersey, by the late Francis Giles, C.E., and the Marine Surveys of the Port.

15. *The Earl of Harrowby*, F.R.G.S.—Report of the Mersey Inquiry Committee.

16. *Mr. Consul Parkes*, F.R.G.S.—Notes on the Hindo-Chinese Nations and Siamese Rivers, with an Account of Sir John Bowring's Mission to Siam.

17. *Captain Sherard Osborn*, R.N.—Notes on the recent Arctic Expeditions.

18. *Sir Edward Belcher*, R.N., F.R.G.S.—Remarks on the several completions of the North-West Passage, by the Officers of the last Expeditions (Collinson's, Belcher's).

19. *James N. Ramsay*, Student of Christ Church, Oxon.—Short Account of an Ascent of Mont Blanc, by a New Route from the side of Italy.

20. *Thomas Wright, Esq.*, M.A., F.S.A.—On the Ethnology of

England at the extinction of the Roman Government in the Island; and on Inscriptions in unknown Characters on Roman pottery discovered in England.

21. *Charles Roach Smith, Esq., F.S.A.*—Remarks on a Roman sepulchral Inscription found in a Saxon vase in the Faussett Collection.

22. *Consul Brand, F.R.G.S.*—Notes on the Portuguese Possessions of S. W. Africa.

23. *Rev. Dr. Livingston.*—Extracts from Letters dated Pungo Andongo, and St. Paul de Loanda, describing his Journey across Tropical Africa.

24. *Señor A. Pory of the Havana.*—Hurricanes in the West Indies and the North Atlantic, from 1493 to 1855.

25. *John Crawford, Esq., F.R.G.S.*—On the different Centres of Civilization.

26. *J. M. Inskip, Esq.*—An Account of the Exploration of the Isthmus of Darien, under Captain Prevost, &c.

27. *Captain Robertson.*—Ascent of the Mountain Suméra Parbut, situated at the source of the Jumna.

28. *Richard Cull, Esq.*—On the Complexion and Hair of the Ancient Egyptians.

29. *Señor Susini.*—The Amazon and the Atlantic Water-courses of South America.

30. *G. Edmonds, Esq.*—On a Philosophic Universal Language.

31. *A. J. Ellis, Esq.*—On a New Universal Alphabet, composed of ordinary Types, for the Use of Ethnologists.

32. *James Gall, Jun., Edinburgh.*—On Improved Monographic Projections of the World, with Illustrative Maps and Diagrams.

33. *Thomas C. Archer, Esq.*—On one of the Coins used on the West Coast of Africa, having an Ethnological bearing.

34. *Richard Cull.*—On the Manual of Ethnology and the Ethnology of Samoa.

The next meeting of the British Association will be held at Cheltenham.

PRESENTATION
OF THE
ROYAL AWARDS

TO DR. DAVID LIVINGSTON AND MR. CHARLES J. ANDERSSON.

AFTER the adoption of the Council Report, the President rose to present the Awards, and Dr. Tidman having come forward, on the part of the London Missionary Society, to receive the Gold Medal for Dr. Livingston, Lord Ellesmere said :—

“ After the observations which have been addressed to this Meeting, on the subject of Dr. Livingston’s merits, by a Right Reverend Prelate, the Bishop of Oxford, a Fellow of this Society, it has become scarcely necessary for me to say anything in justification of an award, which I know will meet with an assent as unanimous in this assembly as it did in our Council-room. If its further vindication were necessary, I should appeal rather to the eye than the ear. I should point to the pregnant sketches of the routes of recent South African discoverers on our walls; and borrowing from the epitaph of Wren the simple word ‘Circumspice,’ request you to search for yourselves, where Dr. Livingston entered on the terra incognita of South Africa, and where, at Loanda, he emerged. The satisfaction with which I pronounce the award of our Society, unanimous as I am sure it is, is only alloyed by the circumstance that Dr. Livingston is not here in person to receive it, as he might have been, but for that noble spirit of perseverance and fidelity to his engagements with a native chief, which has launched him again on his adventurous career. It is some consolation to feel that, in his absence, I could not more appropriately confide this Medal than to the hands of Dr. Tidman, the distinguished Secretary of the London Missionary Society, which has found and sent forth an instrument for their sacred purposes, so illustrious as Dr. Livingston. Your character, Sir, and your functions remind me, that if Dr. Livingston has incidentally done that for science which has deserved from us, as a scientific Society, our highest reward, he has gone forth with even higher objects than those which we specially pursue. Your presence here reminds me that his object has been the introduction of Christian truth into benighted regions, and that the means and method of his action have been strictly appropriate

to his ends. Within these two days a volume in the Portuguese language has been placed in my hands, the record of a Portuguese expedition of African exploration from the East Coast. I advert to it to point out the contrast between the two. Colonel Monteiro was the leader of a small army—some 20 Portuguese soldiers and 120 Caffres. I find in the volume no reason to believe that this armed and disciplined force was abused to any purpose of outrage or oppression; but still the contrast is as striking between such military array and the solitary grandeur of the missionary's progress, as it is between the actual achievements of the two; between the rough knowledge obtained by the Portuguese of some 300 leagues of new country, and the scientific precision with which the unarmed and unassisted Englishman has left his mark on so many important stations of regions hitherto a blank, over which our associate Mr. Arrowsmith has sighed in vain. To you then, Sir, I gladly confide this mark of our Society's appreciation of Dr. Livingston's merits; and I would fain hope that our award will add somewhat to the satisfaction, you and your fellow-labourers must indulge, in having selected and sent forth such an instrument of your high and holy designs."

The Rev. Dr. Tidman replied:—

"My Lord,—In receiving this mark of honour on behalf of Dr. Livingston, I can but very inadequately express the gratification which I feel that my intrepid and devoted friend should have secured the distinguished commendation of the President and Council of the Royal Geographical Society.

"When I had the pleasure on a former occasion of receiving, as Dr. Livingston's representative, the award of a chronometer watch from your Society, I ventured to express the sanguine expectation that, if his life were spared, he would hereafter accomplish more extended labours for the exploration of the interior of Southern Africa. That expectation was founded on the knowledge I have long possessed of the indefatigable industry and dauntless courage of Dr. Livingston; his ardent love of science; and above all, his disinterested Christian benevolence toward the aboriginal tribes of that hitherto unexplored region: for I need not inform your Lordship and this Meeting, that, how anxious soever our Missionary traveller may be to ascertain the Geographical facts and physical features of the country, his first and ultimate object is with *the people*, by introducing them to a knowledge of that inspired volume which is the true source of civilization and happiness in the present life, no less than of immortal hope and joy beyond it.

"When Christian Missionaries half a century since commenced their work of mercy in Southern Africa, the native tribes possessed no symbol, or visible form of thought; and the Rev. Robert Moffat and others had to acquire the knowledge of their rude speech, not by the eye, but by the ear; to make the hut of the savage their study, and by a nice comparison of utterances and sounds, to learn, by slow degrees, the thoughts and feelings of the natives. But over these difficulties their ardour and perseverance triumphed; and they have given back to these aborigines, in their own tongue, various treatises on education and

useful knowledge, together with that inspired volume which can make men wise unto salvation.

"Dr. Livingston, in the course of his extended journey, found his knowledge of the *Sichuana* language invaluable; for notwithstanding the variety of dialects which prevailed among different tribes, he was able to hold easy and intelligent intercourse with all; but, in addition to the charm which the traveller bears about him who can speak the language of the people whom he visits, Dr. Livingston carries with him the stronger charm of truthfulness, rectitude, and disinterestedness—these have secured for him a good name, and throughout his journey, with rare exceptions, he was received with confidence and treated with kindness by the natives.

"I sympathise deeply in the pleasure expressed by the Bishop of Oxford, who moved the adoption of your Report, that this most successful effort to explore the *terra incognita* of Southern Africa has been accomplished by a Christian Missionary; and I can confidently assure your Lordship and this Meeting, that you will find in these devoted labourers, in every field of their efforts, the true friends of science and social improvement, no less than the faithful teachers of religion.

"It would be premature to offer an opinion on the probable results of Dr. Livingston's researches in the future extension of civilization and Christianity in South Africa; but it is a benevolent and noble enterprise to seek out these myriads, who have remained for ages unknown to the great family of man; and as they are now brought within our sympathy, so we may hope, by God's help, to extend to them hereafter the blessings of knowledge and of true religion."

Mr. Andersson being present to receive from the President the gift awarded to him by the Society, of a portable box of surveying instruments, containing a sextant and stand, artificial horizon, watch, thermometers for boiling-point observations, measuring-tapes, &c., the President addressed him:—

"Sir,—It is my agreeable duty to place in your hands a gift of this Society, which, while it evinces their opinion of your merits and achievements as a traveller and discoverer in South Africa, we hope you may turn to account for the farther undertakings you contemplate. It will not diminish its value in your eyes to know that it has been prepared under the counsel and direction of your former companion and constant friend, Mr. Galton. It was with a similar gift from this Society that Dr. Livingston conducted many of his admirable observations. May you have health, strength, and good fortune—I know the skill and the courage will not be wanting—to turn these instruments to similar account. The record of your anterior and recent journeys, and the additions they have produced to scientific and accurate knowledge, are already among the brightest pages of our Journals. We have ample proof of your experience and perseverance, and, admiring the spirit which animates you to seek again the rich field of exploration, in which you have won many triumphs, we look forward with hope and confidence to your return, with still ampler stores and higher honours."

Mr. Andersson replied :—

“ My Lord,—I receive this mark of distinction from the Royal Geographical Society with great pleasure, and with emotions of deep gratitude. Those who have never been in similar circumstances can scarcely form a just idea of the intense satisfaction a person experiences on finding his exertions, however small, thus appreciated. I am sure it must also be highly pleasing to my friend Mr. Galton, now present, to see the person on whom he, as it were, bestowed his mantle, honoured in this manner. This award is doubly gratifying to my feelings, since I can only lay claim to be half an Englishman. Once more, my Lord, allow me to thank you for this award, as well as for the kind, feeling, courteous, and flattering manner in which your Lordship has presented it.”

ADDRESS

TO THE

ROYAL GEOGRAPHICAL SOCIETY OF LONDON;

Delivered at the Anniversary Meeting on the 28th May, 1855,

BY THE RIGHT HON. THE EARL OF ELLESMERE,
K.G., D.C.L., &c.,

PRESIDENT.

OBITUARY.

THE melancholy list of our losses for the last year commenced with the name of one who was an ornament to the military profession, Sir F. Adam. I have now, as I had then, to pay a tribute, as well of private affection and regard, as of public respect, to a distinguished officer of whom death has deprived us, General Sir A. Barnard. To recite his professional career would be to follow the British army from Lisbon to Waterloo. For the particulars of it I refer you to Napier and the 'Despatches.' I might appeal to their authority, I might appeal to that of Lord Raglan, to confirm me when I say, that among those who fought under the eye of Wellington, and who earned the glorious reward of his esteem and confidence, there was no better soldier—I am sure there was no kinder and better man—than the late Governor of Chelsea Hospital. As a proof of the confidence of the Duke, I may single out the fact, that when the chances of war had placed an English garrison at Paris, he was selected for the office of commandant. I have no doubt of the grounds of that selection. They were, that from his nature and his disposition he was, of all others, the man—in other respects competent for such command—the least likely to exercise it with any insolence of success, or any want of regard to the feelings of a gallant enemy. I knew him well, almost from the date of his retirement from active service. He retained to an advanced age singular

activity of body and mind. He was a bold rider, an accomplished musician, and, at an age when few are adventurous, he underwent the fatigues of an extensive tour in Syria. Trivial details these, but they may be excused as springing from the recollection of a friendship of many years. He passed his latter years in that honourable retirement at Chelsea which was the appropriate reward of his professional services, surrounded by friends—

“Well pleased to see reflection’s genial ray
Gild the calm close of valour’s various day;”

and where those who had followed him to battle, demanded and obtained the honour of bearing their old commander to the grave.

Sir Henry Thomas De la Beche, the eminent geologist and physical geographer of our day, possessed a lively perception of the intimate connection, which must ever subsist between the structure of the crust of the earth and its outlines. Early in life, when studying at the Military College of Marlow, he already exhibited those powers of the pencil, and that facility of sketching the forms of ground, which led him to acquire a knowledge of the rocks beneath the soil.

Entering into the Geological Society in the year 1819, at the early age of twenty-one, he rapidly rose in the estimation of his brethren of the hammer, whether by his good eye for surveying a country, or by his readiness in delineating it, accompanied by sketches of its pictorial features and chief fossils.

From the year 1819 onwards, the Geological Society was indebted to him for graphic descriptions of the southern and south-western coasts of England and Wales, as conveyed in a series of highly valuable memoirs; whilst in foreign geology, his publications on parts of France, Nice, La Spezia (in Italy), and, above all, his excellent memoir on Jamaica, where his paternal estate was situated, justly established his reputation as a geologist and physical geographer.

The author of such labours was therefore well qualified to produce valuable general works, one of which, the ‘Manual of Geology,’ the first effort of the kind, was for many years the standard to which all students of our sister science appealed; whilst his ‘Researches in Theoretical Geology’ are, I am assured, of the highest order of merit. In fact, the last-mentioned volume, indicating, as it does, his acquaintance with several branches of science, was the admiration of all his associates in exhibiting those powers of mind which enabled him shortly afterwards to rise to that station in which he rendered so much public service to his country.

Whilst the great merits of our deceased member will be appropriately

dwelt upon by the Presidents of the Royal and Geological Societies, I may be permitted to express my own hearty approbation in common, I am sure, with every one whom I now address, of the energy and ability with which he suggested the great design of a complete geological illustration of the trigonometrical maps of the British Isles, and thereby induced the Government to found and rear under his auspices, that great national establishment, the Museum of Practical Geology. To use the language of his successor, Sir Roderick Murchison, when receiving for his friend—then, alas! within ten weeks of his death—the Wollaston Medal of the Geological Society—

“This design, entirely his own conception, was begun, carried out, and matured by the combination of scientific skill with those *practical* evidences of the value of his project, in the absence of which he never could have commanded success in an undertaking which, though applauded by ourselves, was alien to the pursuits of the great body of Englishmen.

“And how did he succeed? At his own expense he traced the boundaries and relations of certain rock-formations, and, laying them down on the Ordnance Survey Maps, accompanied by illustrative Sections, he thus took the first step in leading public men (otherwise little versed in our science) to see the good which must result from the extensive application of such a scheme, in making all proprietors alive to the importance of obtaining a better acquaintance with the subsoil of their estates.

“Having gradually attracted the notice of the Government, and having obtained the use of rooms in Craig’s Court, and the employment of a limited sum of the public money, Sir H. De la Beche then attached to his new-born establishment, able men of science, who could decipher formations in the field, describe the fossils they contained, or chemically analyse the structure of the rocks and their associated minerals. Soon filling to repletion the small space allotted to him with models of mines, illustrative drawings, and specimens of fossils, ores, and building-stones, he convinced our rulers, and particularly that illustrious statesman Sir Robert Peel, that the dignity and interests of the country required, that an adequate and appropriate building should be erected, and exclusively devoted to the fulfilment of a project so lucidly devised, and thus far so well realised.

“Then arose, and very much after the design of the accomplished Director himself, that well-adapted edifice in Jermyn-street, *which, to the imperishable credit of its author, stands forth as the first Palace ever raised from the ground in Britain which is entirely devoted to the advancement of Science!*

“Once possessed of halls worthy of so noble an object, Sir Henry De la Beche next rendered them practically useful to the public, and on a vastly extended scale, by embracing, as necessary adjuncts, metallurgy and mechanical science in addition to the branches of knowledge previously cultivated. When we reflect on the eminence of the men of science with whom he surrounded himself, including our last and deeply lamented President Edward Forbes, and have seen how admirably they preside over their schools, what solid instruction they impart, and all directly supporting geology—when we visit the galleries in which the shells, fossils, and minerals are so arranged as to illustrate the value of the maps, sections, and publications of the Survey, we geologists must feel more strongly than any other class of men the deep obligations of our country to Sir Henry De la Beche.

“In speaking of this Museum as a School of Mines, and in recollecting that the

value of raw material produce extracted annually from the subsoil of Britain is not less than 25 millions sterling, you must be reminded of the practical and efficient manner in which Sir H. De la Beche was enabled, from long residence in mining tracts, to convey to many individual proprietors much useful knowledge in their own local language, and to send them away well pleased with his cheerful and friendly explanations. Here, however, we must extend our vision beyond our Islands, and, whether we look to Canada, Australia, the Cape, or Hindostan, we see that well-trained geologists have been sent or are going thither from our National School of Mines; thus making our vast Colonial possessions keep pace with the advancement of the mother country."

Such a record brought before the best possible judges of the subject, and affirmed by them to be thoroughly well deserved, renders it unnecessary for me to do more than add, that the last work of Sir Henry De la Beche, in conjunction with Mr. Trenham Reeks, on the Porcelain and Potteries of our country, is a pregnant illustration of the animus with which he strove to develop the intimate connection not only of the useful, but also of the fine arts with geology, by clearly describing the lithological structure and chemical condition of the various earthy materials employed in ceramic manufacture.

A paralytic disorder, which had been creeping upon him for the last few years, carried off this eminent and highly useful man, at what may be called the premature age of 59. For, though his limbs failed, and the palsy gained rapidly on him, his mind was fresh to the last; and such was his indomitable energy, that even though lifted into his chair for some weeks, he transacted business at the Museum of Practical Geology, only thirty-six hours before his death. He died deeply regretted by all those who knew how to value the true friendliness of the man, as united in him with the solid acquirements of the philosopher.

Besides numerous honours which were conferred upon him at home, including the Companionship of the Bath, and the Wollaston Palladium Medal of the Geological Society, Sir Henry De la Beche was a Correspondent of the Institute of France, an Honorary Member of various Foreign Academies, a Knight Commander of the Danish Order of Dannebrog, of the Belgian Order of Leopold, and an honorary member of numerous scientific bodies at home and abroad.

It is impossible to repair, as far as private acquaintance and friends are concerned, the loss of such a man; it is not easy to provide, "*ne quid Respublica detrimenti capiat*," from such a decease. So far as his public situation is concerned, the Government has done its best in the appointment as his successor, of one whose merits and services are too well known to this Society to allow me to dwell upon them, more especially in his presence, and whose special capabilities for the direction

of the Museum of Geology are beyond comment or cavil—Sir R. Murchison. Beyond this country, and throughout the Continent, the verdict of approval will be delivered in many languages; and for common convenience, as in the former days of diplomacy, it may be summed up in Latin—"Uno avulso non deficit alter aureus."

The name of Captain John Beecroft will be found on the pages of many volumes of our Journal as a prominent participator or leader in most of the efforts that have been made to investigate the geography of the Niger and other rivers falling into the Gulf of Guinea. Our second volume records the zeal and ability with which he used the influence that he possessed, at that early period, with the chiefs on the Old Calabar River, in order to facilitate the progress of Mr. Coulthurst in the attempt to penetrate the interior of Africa in 1832, which was unhappily prevented by that traveller's death.

A company at Liverpool had sent an expedition to the Quorra in 1832, and after its dissolution the steamer which they had sent out was purchased, and placed under the command of Captain Beecroft, who ascended the Niger in her in September, 1835, as far as Adacado, a walled town, within two miles of the confluence of the Chadda.

In 1840 Captain Beecroft ascended the Formoso in the 'Ethiope' steamer for about 70 miles, where his progress was stopped by the exuberant vegetation of the river. He then explored the Warree, and discovered its junction with the Nun mouth of the Niger, a short way below Eboe. He continued this voyage up the Niger as far as Lever, between Rablah and Busah.

In 1841 Captain Beecroft rendered material assistance in rescuing H.M.S. 'Albert,' after the melancholy illness and deaths of her officers and crew. After this service he ascended the Old Calabar, and then the Cross River, for 70 miles, as far as Ommann. In the following year, 1842, he again ascended the Old Calabar River, in the 'Ethiope' steamer, and explored its course as far as the Rapids, which he named after his vessel. He was subsequently appointed governor of Fernando Po; and in 1850 he is mentioned in the President's Address as consul-general for West Africa. When the Chadda expedition was despatched from England, in the 'Pleiad' steamer, it was intended that the party should proceed up the river under the experienced command of Captain Beecroft; but that veteran explorer's death took place about a week before the arrival of the party: and in him the Society has lost one of its most practical African geographers.

Mr. William Brockedon, whose contributions of portraits to our Society are familiar to the Fellows, became a student of the Royal

Academy in 1809. Zealously attached to his profession, he visited the various schools of painting abroad, and subsequently exhibited his pictures at the Royal Academy with much regularity, and with no little credit to himself.

In 1824 he made an excursion to the Alps, for the purpose of investigating the route of Hannibal. This journey suggested his great work, '*The Passes of the Alps*,' the materials for which he collected during the summers of 1825, 1826, 1828, and 1829; and it is well known that he crossed the mountains 120 times. He also published several works of travels in Italy, and contributed the Savoy and Alpine portions of Murray's '*Handbook for Switzerland*,' to which most of us, who have wandered in that interesting country, must feel indebted.

Of late years Mr. Brockedon directed his attention to those scientific pursuits which had such a charm for him in early life, when he invented the mode of drawing gold and silver wire by means of holes pierced in gems, which is now in general use. His claims to the distinction of a man of science rest upon numerous very ingenious practical applications, which were often successful. He succeeded in first reducing the small pieces of plumbago in its natural state to an impalpable powder, and then, by powerful pressure in vacuum, produced a cohesive attraction of the most intimate kind among the particles, exactly resembling the native blacklead. But, perhaps, he is best known from being associated in the manufacture of vulcanized Indian-rubber, and from his experiments and discoveries in that important article. Mr. Brockedon was a Fellow of the Royal and several other Societies, and was the founder of the Graphic Society.

Captain Sir P. Broke was eldest son of that distinguished officer who commanded the '*Shannon*' in her engagement with the '*Chesapeake*.' In the course of his naval career he served as senior lieutenant of the '*Genoa*' in the action of Navarin.

Mr. J. C. Burnett, though but for a short time a member of our Society, was one from whom, had his life been spared, we might have expected valuable co-operation; for, though he died in his thirty-ninth year, he had been for twenty years in Her Majesty's service in the Surveying department in Australia. His services there were numerous and brilliant; the most arduous and memorable was an exploration conducted by him in 1842; of the dividing range of mountains from Hanging Rock to the 30th parallel. From Moreton Bay, where he was subsequently placed in chief authority, he accomplished several other surveys of importance; and the name of the Burnett River records the sense entertained of his merit by the Governor, Sir C. Fitzroy. The

press of the colony has borne ample testimony to his private virtues, as well as to his public services; and the occasion of his obsequies at Moreton Bay elicited a strong demonstration of the respect and affection in which he was held by his fellow citizens.

Our Society participates with the House of Lords in the loss of the Earl of Dartmouth. He was one who passed a long life in the unambitious, but exemplary and constant discharge of the duties attached to high station and large possessions.

Captain James Fitzjames was an officer of considerable scientific attainments in his profession, and few who, like him, entered the navy so late as 1825, have found more opportunity for service and distinction. He was most actively employed on the coast of Syria, and was repeatedly mentioned in the Gazettes of the Chinese war. He had also a large share in an enterprise connected with the special objects of this Society, Colonel Chesney's survey of the Euphrates, in the steamer of that name, during which he met with a severe accident, and was once in captivity of the Arabs for ten days. He is still better known as one of the brilliant list of Arctic commanders, and one of the principal victims of the last ill-fated expedition.

If I were to attempt, with the means and time at my disposal, to do anything like justice to the next name on my list, I should not satisfy you and should utterly dissatisfy myself, for it is that of Admiral Sir John Franklin. Even in such an audience as the one before me there may, however, be some few who, engrossed by the fame of the Arctic voyager, may not have known, or have forgotten other and earlier incidents of the naval officer's career. I may remind these, that the hero and victim of Arctic enterprise was early trained to such adventure in Australian waters, where, under command of his relative Flinders, a name dear to geographers, he shared with him the perils of shipwreck in 1803. I may mention, that were Franklin's name unknown as a navigator, it would have been entitled to honour for service under Nelson at Copenhagen and Trafalgar. With respect to the latter action, it were enough to say that he stood through it, as signal midshipman, on the poop of the 'Bellerophon,' and was one of some six out of forty, who escaped unhurt from the hot work of that day and that position. He had previously, in 1804, filled that very post on board the 'Camden' East Indiaman, in the singular action in which Captain Dance, with a fleet of ill-manned and ill-armed merchantmen, beat off an admiral and a squadron of ships of war. He served to the end of the war under Cornwallis, Strachan, and St. Vincent, and was wounded in a gun-boat affair at New Orleans. These were services sufficient to place his name in good

company and in an honourable, but not exceptional, position on the Navy List; but though war was over and promotion won, the real harvest of his fame was yet to be reaped. Franklin's share in Buchan's maritime expedition for Polar research, was a prelude to that more famous expedition for the exploration of the North American coast, which he commanded from 1819 to 1822. There is probably no person present here who can require even a summary of the adventures of that protracted enterprise. His own lucid narrative has made every one familiar with its incidents. If it were necessary for me to measure off the 1200 miles more or less of coast-line which it added to our maps, or to enumerate its other contributions to the science which we cultivate and the knowledge of the world we inhabit, I should be at a loss to arrange and condense such materials. I should have been much tempted to ask your permission to depute such a task to another. The temptation were strong, for there sits among us one who shared the toil, the danger, and the glory of the undertaking—"quorum pars ipse fuit"—and I may well add, "*quæque ipse miserrima vidit*,"—one who could speak to the deeds performed and the results obtained; to the fortitude, the endurance, and the skill of its commander; and more than this, to the eminently Christian character of his nature, the tenderness, the humanity, the care for the lives of others of one so ready to risk his own, and in whom no experience of danger and suffering could dull the edge of honourable ambition or damp the fire of considerate daring. On these topics I could at best but give a digest of matter with which you are all familiar. Sir George Back, from the richer source of personal recollection, could adorn a subject which such an occasion as this, would not permit even him to exhaust. Still less can I venture on the sad details of the sequel, and look behind the half-lifted veil which still interposes between us and full knowledge of a catastrophe, which leaves us no room for doubt or hope. I cannot do justice to the gallantry of the efforts which have been made in search of that secret of the North—to the sacrifice of Bellot, which seems almost to have been an inauguration of our alliance with the country which gave him birth; to the sympathy of America, which leaves us not without anxiety for the fate of Kane and his companions; lastly, to the sacrifices and the sorrows of those whom I might not inappropriately address in the language of a tender and natural passage of Home's tragedy—I mean that where the heroine, forgetting the triumph of the moment in her woman's sympathy for the mothers and widows of the fallen foe, exclaims—

"Ye dames of Denmark, 'tis for you I mourn,
Who, sadly sitting on the sea-beat shore,
Long look for Jorika that never shall return."

So long as the name of Franklin shall be bright in the annals of British heroism, will the unwearied devotion and energy of his widow be with it, remembered and honoured.

Mr. George Bellas Greenough was born in 1778, his paternal name being Bellas, and the name of Greenough that of his mother. Educated at Eton and Cambridge, in 1798 he went to Göttingen to study law, but the racy and original eloquence of Blumenbach attracted him to natural science, which he never afterwards abandoned. At Göttingen also, he became the intimate friend of Coleridge. Learning the elements of mineralogy and geology under Werner at Freiberg, and improving his knowledge by travelling through Germany, Italy, and Sicily, he returned to England in 1801, and then explored the mining tracts of Cornwall and the Scilly Isles. From 1802 to 1807, an active member of the Royal Institution, he was associated, as its secretary, with Wollaston, Davy, Hatchett, Babington, and others. In 1806 he visited Ireland with Davy, and, accompanied by Mr. R. Hatton, made a geological tour. In the following year, 1807, he accomplished the establishment of an independent Geological Society, of which he became the first President. In that year also Mr. Greenough became a member of Parliament, in which he remained until the dissolution in 1812. He prepared himself for his duties by careful study of the great questions then before the country, and was known in committees for his diligent and conscientious investigation of facts. While preserving his own independence, he obtained for himself the high esteem and respect of the then leaders of liberal opinions. His own having been formed in the school of Adam Smith, Jeremy Bentham, Sir Samuel Romilly, and Francis Horner, were firmly and constantly maintained through life.

In spite of the opposition created in 1809 by Sir Joseph Banks, Mr. Greville, Mr. (afterwards Sir Humphry) Davy, and other leaders of the Royal Society, who wished to subject the publications of the new Society to the control of their own, Mr. Greenough steadily supported its independence, and the first volume of its 'Transactions' appeared under his renewed Presidency in 1811. He thus set the example, which has led to the establishment of other Societies devoted to special branches of science.

Though it is not my province to delineate the qualifications of Mr. Greenough in other sciences than geography, I would remind my auditors that as early as 1819 he published the work entitled 'Critical

Examination of the First Principles of Geology,' which was translated into the French, Italian, and German languages, and elicited in the following year a warm encomium from the pen of the celebrated Jeffrey, then the chief editor of the Edinburgh Review. Well might the reviewer admire the intrepid honesty with which our deceased friend then overthrew some of the prevailing dogmas, in essays of which he himself spoke so modestly in his preface, as to say that, "before many years have elapsed, they will be found to contain as many errors as they presume to correct."

His chief geological work, the 'Map of England and Wales,' is indeed so intimately connected with our own pursuits that I am bound to notice it—the more so as it was the direct result of many years of arduous researches with his contemporaries, Buckland, Conybeare, and others. This map was not completed without laborious comparisons of the rocks of our island with those of various parts of the Continent, which latter he repeatedly explored. Whilst the cost of its mere publication was very considerable, it is right to state that his colleague, Mr. Henry Warburton, then a zealous member of the Geological Society, contributed largely towards this desirable object. As an Englishman I rejoice to advert to such liberality on the part of individuals in advancing science and in accomplishing works of which any Government might be proud.

From the year 1823-24, when he built his beautiful villa in the Regent's Park, to the close of his life, Mr. Greenough was the active and liberal promoter of science, an indefatigable member of the Society for the Diffusion of Useful Knowledge, and one of the original Council of the, then, London University. In the year 1831 he was, together with my predecessor, Sir R. Murchison, one of the first who met at York to found the British Association for the Advancement of Science, having already, the preceding year, assisted in the establishment of this Society, of which he was elected at once a Vice-President. Having gathered together a vast variety of maps from all countries, and having made himself a thorough master of the literature of our science, Mr. Greenough was subsequently elected President of this Society; and we justly refer to his Anniversary Addresses as evincing that precision of thought, that unflinching love of truth, and that undaunted perseverance, which were his constant guides.

In the latter years of his life his chief occupation was the completion of the geological map of India, for which he had been collecting materials during a long period—a work which, like all the efforts of the man, stands out as a great landmark, pointing the way to vast re-

searches, which, though of deep importance to our Indian possessions, have, until within the last few years, been unaccountably neglected by public men. In architecture as in archæology, Mr. Greenough was also a proficient, whilst he was a most devoted adherent to ethnology. Always justly considering that science to be interwoven with geography, it gave him sincere pleasure when, in 1849, these twin sisters were united, by the efforts of my predecessor, in one section of the British Association.

The last bequest to us, of his valuable geographical library, accompanied by a sum of 500*l.* to enable us to arrange the collections so given,* induces me to hope that our Council may direct a bust of our deceased friend to be placed near to these donations, with which he intended to enrich us, to be for ever a memento of the benevolent man, whose life was so usefully spent in diffusing knowledge among his countrymen. For, though Mr. Greenough was truly loved and esteemed by all those who had the privilege of his intimacy, and who were acquainted with his kindheartedness, sincerity, and modesty, I am assured, by one who well knew how to estimate his scientific merits, that nothing like adequate justice has been rendered to him in honorific distinctions either at home or abroad. Let it, therefore, be our pride thus to record our admiration of the deep-thinking philosopher and true geographer, George Bellas Greenough.

This is not the place, nor am I the person, to do anything like justice to the long public career, political character, and services of Mr. Joseph Hume. I may, however, in this chair claim the right to give my testimony to his services as a member of our Society and our Council. It is my right and duty to remind you that his association with us very lately brought into evidence a bright and constant feature of his character—the desire for the diffusion of sound knowledge among all classes of his countrymen. His known and proved hostility to all misapplication of public money, had given him a just and well-

* *Extract from Mr. Greenough's Will, as forwarded to the Society by his Executors, Mr. R. Hutton and Mr. Decimus Burton.*—"I place all that portion of my several collections of books, maps, charts, sections and engravings which relate to Geology and Geography, at the disposal of my executors, desiring that they will, within six months after my decease, divide and hand over the same to the Geological Society of London, and to the Trustees of the Royal Geographical Society of London, for the use of the Fellows and Members thereof, in such proportions and in such manner as may appear to them, my said Executors, most suitable to the wants and purposes of the said two Societies respectively, and most conducive to the advancement of Science; and I leave to each of the Societies aforesaid 500*l.*, wherewith to defray the expense of accommodating the collections so given, and in furtherance of such other objects as to the Councils for the time being of the said Societies respectively may appear most desirable."

earned authority on all questions of its sound and judicious application. He had looked with an honest and intelligent eye into our concerns; he understood and sympathised in our objects; he had confidence in our intentions and means of usefulness, and he recognised and aided our claim upon assistance towards the first essential of our action and expansion. It is to him we owe in great measure, that I can address you for the first time in a locality of which all present must feel the advantage and convenience. It is to him in great measure that we have incurred an obligation which I hope we shall redeem—that of giving the public the fullest benefit of the instruments of research and instruction we have long possessed, but have hitherto scarcely been able to turn to account. I lament that he was not allowed to witness and to watch, as a member of our Council, the proceedings which he thus to the close of his life did so much to encourage. I had looked forward to this opportunity of returning my acknowledgments to the living; I can only use it for the expression of my respect for the memory of the deceased.

There can be few who for the last 30 years, or, I may say, the last half century, have been engaged in the public service—and in this term I include the scientific, the charitable, and the religious and educational associations of the country—who cannot say with me, that they have lost a friend in Sir Robert Hurry Inglis. In the House of Commons, at Oxford, in the British Museum, wherever men of action, of thought, of benevolence, most do congregate, he will be missed and regretted.

Lieut. Colonel John Augustus Lloyd, F.R.S., died at Therapia, from an attack of cholera, which seized him in the Crimea after the battle of Alma. He had been sent to the East on a mission to the Circassians; but on reaching head-quarters, he was detained there, and employed in observing the movements of the enemy, and in collecting information. Colonel Lloyd's love of scientific enterprise has rendered his career remarkable for more than 30 years. After passing some time in various islands of the West Indies, he resolved on exploring the American Isthmus: with this view, he obtained introductions to the Columbian liberator, Bolivar, who engaged him at once as an officer of engineers; and, after being employed for some time in other duties, he was supplied with instruments and assistants for the survey of the Isthmus of Panama. His progress, however, was interrupted by disturbances at Cartagena, where he assisted in restoring order, after receiving a severe wound, and narrowly escaping death.

He succeeded at length in forming another party, and without money, except from his own resources, he made a trigonometrical survey of the Isthmus of Panama, together with numerous topographical observations. An account of this survey was published by the Royal Society in 1830; and a paper on the same subject was contributed by Colonel Lloyd to the first volume of our *Journal*. The line of communication thus marked out, has now become the site of the railway between Chagres and Panama.

In 1831 Colonel Lloyd conducted the Thames Levelling Commission, under the conjoint authority of the Admiralty and the Royal Society. He was soon afterwards appointed H. M. Surveyor-General and Civil Engineer-in-Chief at Mauritius, where he constructed numerous public works, established an astronomical observatory, and made a trigonometrical survey of the island. His daring ascent of the Peter Botte mountain, unrivalled in the records of adventure, is described in the third volume of the *Journal*.

During Colonel Lloyd's engagement in the Mauritius he compiled a new map of Madagascar, which, with a paper on that island, was communicated to this Society in 1849, and afterwards printed in the *Journal*. In returning to Europe he visited Ceylon, and subsequently made a tour of inquiry to most of the principal observatories on the Continent. The organization of the Great Exhibition in Hyde Park presented a new field for his energetic talents, and he was selected by Prince Albert for the post of Special Commissioner in conjunction with Dr. Lyon Playfair. At the close of the Exhibition Colonel Lloyd's previous experience led to his appointment as chargé d'affaires in Bolivia. While in that part of South America, he continued his communications to the Society; and papers received from him appeared in the twenty-third and also in the last volume of the *Journal*. His return from Bolivia was soon followed by his mission to the East, where he fell a victim to the disease which has proved fatal to such large numbers of our gallant countrymen.

A friendship of long standing makes me one of many sincere mourners for the decease, which occurred a very few days since, of Lord de Mauley. He was one of those useful members of society who are ready to turn the advantages of social position and influence to the diffusion of knowledge and the promotion of scientific enterprise. On this head it is sufficient to say that he was among the earliest and most efficient promoters of the submarine telegraph.

Rear-Admiral David Price was an officer the narrative of whose services since 1801 fills pages in our naval annals. His death in

the recent unfortunate action at Petropolovski has been a subject of deep and general regret.

Francis H. Trithen, M.A., was an excellent Oriental scholar, and formerly, for a short period, our Secretary, until he was appointed Professor of Modern Languages at Oxford, where he died recently, at an early age, justly regretted for his amiable character.

Our obituary further includes the names of Mr. Henry English; Mr. William Newnham; Major-General William Sandwith; the Right Honourable Henry Tuffnell, M.P.; John Henry Vivian, M.P.; and J. E. Winterbottom, Esq., M.A.

Foreign Geographers deceased.—France has lost a very distinguished hydrographer in M. Beautemps-Beaupré, one of our earliest honorary members, and chief of the French Hydrographical Office. At an early age his talents had raised him from the business of a map-seller to scientific distinction, and he was appointed first geographical engineer to the surveying expedition despatched by the French Government, under Admiral Bruni d'Entrecasteaux, in search of the unfortunate La Pérouse. The construction of the atlas of this voyage afforded M. Beaupré an opportunity for improving the methods of hydrographical surveying, and the 39 charts which it contains were at the time unequalled. Under Napoleon I., M. Beaupré was constantly employed in surveying the rivers and ports of the North Sea, and in examining the Adriatic and other points to which the views of the Emperor were directed. But the great work, which occupied him more than twenty years, and which he had the happiness of being enabled to complete, is '*Le Pilote Français*,' in six atlas-folio volumes, embracing a coast-line of 466 leagues, of 25 to a degree, and including 613 distinct works. M. Beautemps-Beaupré died at the age of 82, after rendering eminent services to his country for 63 years.

Admiral Roussin, after obtaining much distinction as an officer of the French navy under Napoleon, was subsequently employed on an hydrographic survey along the coast of Brazil. He was President of the French Geographical Society in the years 1843 and 1844.

M. Rochet d'Hericourt is known for two explorations of Abyssinia, performed, the first in 1839, and the second between 1842 and 1845. His services to science were acknowledged by his appointment to the French Consulate in Abyssinia. He died lately at Djedda.

General Carbuccia, of the French army, a Corsican by birth, turned to profit a command held by him in Algeria for researches into the Roman geography and the archaeology of the district of Bathun. He died lately, in his country's service, at Gallipoli.

M. Vattier de Bouville, brought up for the French interpretation service in the Levant, had furnished valuable notices of the geography of the Cyrenaica.

M. A. Michelot, a pupil of the Polytechnic School and an officer of much service, was author of several works on geography.

OUR OWN LABOURS.

Our labours during the past year have been attended by events not a little remarkable.

The return of Dr. Rae with substantial evidence of the traces of Franklin was soon followed by that of Sir Edward Belcher and his party, accompanied by Captain M'Clure; and shortly afterwards news arrived of Captain Collinson's safe exit from the ice on his way homeward. At the first evening meeting of the session, a paper by Dr. Rae, 'On the late Arctic Expeditions,' brought together several of the most eminent voyagers who have penetrated the Frozen Zone; and among those who joined in the discussion were Captain M'Clure, Captain Kellett, Colonel Sabine, Dr. Scoresby, Sir John Ross, Captain Inglefield, Commander Osborne, Lieut. Pim, and Dr. Rae. After the return of the Hudson Bay Company's land party, now travelling towards the mouth of the Back River, and of Dr. Kane and the expedition sent in aid of him, it may be presumed that further Arctic research will be left to the whalers in Behring Strait on the one hand and Baffin Bay on the other. The Americans, it is reported, have resolved on passing through Behring Strait to fish off the North coast of the continent; and it will be in your recollection that the value of the banks of the Mackenzie River, as a site for a fishing settlement, has been already indicated by others.

Our proceedings have drawn in a still more striking manner from the progress of exploration in all parts of Africa, the mysteries of which seem to be rapidly disappearing before the enterprise of the nineteenth century. The southern part of the continent is, in fact, becoming so important from the extension of commerce with the interior and the development of mineral wealth, that Her Majesty's Astronomer at the Cape of Good Hope, Mr. Maclear, urges the pressing necessity of an adequate survey of its shores; and a notice on this subject, communicated through the late lamented Sir George Cathcart, has been brought before us.

Mr. Andersson read an account of his journeys from Valfisch Bay to Lake N'gami, which he nearly perambulated, and of his ascent of the Tiogé River, accompanied by an original map of his researches

in these regions, the value of which we have to-day acknowledged by an appropriate testimonial.

Dr. Livingston's memorable journey from the Cape to Loanda has formed the subject of several communications. Fortunately the loss of his despatches in the 'Forerunner' did not deprive us of the original map of his route, now in our possession, and the narratives also will doubtless be replaced.

Farther North the Niger-Chadda Expedition has realised, under the skilful management of our associate, Dr. Baikie, results that brighten the prospect of future operations on those great rivers. The hydrographical map drawn by his companion, Mr. May, R.N., from the original survey by the latter, both confirms and corrects previous results, including the reported course of the Chadda laid down by Dr. Barth on his visit across the river to Yola.

Several letters relating to the Central African Expedition have been forwarded to us by favour of Lord Clarendon, and read at our meetings; and none have been more welcome than the tidings of Dr. Barth's safe return from Timbuktu to Kano, on his way to Europe. The most material contribution to geography among these papers is the map of a part of the Niger formerly traversed by Mungo Park, whose death deprived us of his observations. Dr. Barth followed the river on his return from Timbuktu, and the map delineates that part of its course between Garo and Say. Other maps necessary to complete his routes appear to have been sent to Europe, but have not as yet been placed before us.

From North-western Africa a narrative of a tour from the Gambia to the Salum River, by Governor O'Connor, has been read.

Eastern Africa has also contributed its quota to the geographical progress of the period under review. 'The Political Institutions and Present State of Abyssinia' formed the subject of a paper containing many details of interest to the geographer, the merchant, and the traveller. A collection of drawings made on both the shores of the Red Sea by the late Dr. Kirk has been added to our stores. Lieut. Burton's bold journey from Zayla to Harar, placed him in that city on an altitude of 5000 feet, in a delightful climate, on the eastern flank of the mountains, running N. and S., which appear to separate the waters of the Nile from those flowing to the Indian Ocean; and which are stated by the missionaries Krapf and Rehmunn to ascend above the snow line in the two peaks called by them "Kenia and Kilimanjaro;" the same range farther S. forming also the probable basin of the Lake N'yassi. Lieut. Burton's subsequent disaster at Berbera, has suspended further operations in these quarters for the present.

A communication was also read from Dr. Rebmann, dated Kisuludini in Rabbai, S.E. Africa, containing an account of the Great Lake N'yassi, and of the tribes on its banks, obtained from a native of those regions in his service. This large body of water, so long since inscribed on maps, continues to be one of the most inviting features of that preponderating part of African geography which is only derived as yet from indefinite and unauthenticated reports. A visit to this lake, and the determination of its position, extent, and drainage area, remains a prominent geographical desideratum.

Passing to the Asiatic Continent, we have had Lieut. Burton's account of his journey from Medina to Mecca;* a letter from Mr. Wallace, dated Sarawak, describing his observations at Singapore, and a journey into the Malay Peninsula as far as Mount Ophir; an account of Frontier Tribes near Kohat, W. of the Indus, by Lieut. Sykes; Geographical Notes of Journeys in Persia by Mr. Keith E. Abbott, Her Majesty's Consul at Tehrán; and an Account of the recent Earthquakes at Brussa.

From America we have received 'Commercial Notes on California' by G. Aikin, Esq., Her Majesty's Consul at San Francisco; a paper 'On the Sources of the Purus,' a great tributary of the Amazon, by our associate Mr. Clements Markham; and before the closing of the Session Mr. Bollaert will communicate his researches on the Geography, Mineralogy, and Antiquities of Chile and Peru, during his last visit, from which he has just returned.

The North Australian Expedition which the Society brought under notice of Her Majesty's Government and the public in 1853, and has since constantly urged forward, was undertaken by the Colonial Office in 1854, and immediately provided for by a Parliamentary grant. It has at length, after sundry changes and delays, been forwarded a step by the despatch of four members of the party, with the stores selected in England, in expectation of meeting the leader at Sydney, where he is directed to join them from Western Australia. The party from England consists of Mr. Wilson as geologist, Mr. Baines as artist, Mr. Elsey as surgeon and naturalist, and a young botanist from Kew. This party is intended to be placed under the command of Mr. Augustus Gregory, a colonial surveyor in Western Australia, whose explorations in the interior from that settlement are known to the readers of our Journal. The expedition is, I believe, to be fully organized at Moreton Bay, whence it will be conveyed to the north

* Since writing the above, two volumes out of three have been published by Longmans, under the title of 'Personal Narrative of a Pilgrimage to El-Medinah and Meccah,' by Richard F. Burton.

coast in a steamer, which will remain in communication with the land party, as advised by our Council. Some account of this stage of the proceedings may be expected during our recess; and through the co-operation of the steamer it may prove practicable to forward occasional reports during the progress of the service.

An announcement was made to the Society by our veteran member Capt. P. P. King, of the capture of some cattle, which there was reason to believe had accompanied the missing explorer Leichhardt. Every opportunity will doubtless be taken by the North Australian Expedition to ascertain his fate. The exploration from South Australia, mentioned in my former Address, and for which the Government of that colony had voted 5000*l.*, has, I regret to say, not taken place.

Dr. P. C. Sutherland, an Arctic voyager and author, one of our associates, and to whom a collection of our instruments has been lent, has given us a very interesting account of his voyage to Natal, where he was when we last heard from him. He had kept up a series of trihoral observations throughout the voyage, embracing atmospheric and oceanic phenomena, and particularly the distribution and habits of marine animals. He has also specified some features of the currents on the African coast which deserve attention.

Another of our associates, Mr. J. G. Frith, has communicated a report of the discovery of a group of islands in the South Indian Ocean, by Captain J. S. Hutton, commanding the merchantman 'Earl of Eglintoun,' from Glasgow, on the 1st of December, 1854, in lat. $52^{\circ} 56'$ S., and long. $73^{\circ} 50'$ E. In the Nautical Magazine for April of this year, it is stated that Capt. Macdonald, of the ship 'Samarang,' had already reported the discovery of two islands, apparently of volcanic origin, one in lat. 53° S. and $72^{\circ} 35'$ E., and the other in lat. $53^{\circ} 3'$ S., and $73^{\circ} 31'$ E. Capt. Cook, it appears, passed about 10 miles from the position of these islands in 1773.

Admiral Smyth, whom fame will always place chief among the hydrographers of the Mediterranean, has communicated to us a letter which he had received from Admiral Matthieu, relative to the progress of the survey in the Strait of Gibraltar, which appears to be nearly completed by the Geographical Engineers of the French navy, under Admiral Matthieu, who also intimates that a model is being constructed to illustrate the remarkable character of the soundings.

The Council Report has already told you of the assistance which has been rendered through your Secretary to Her Majesty's Government in the selection of candidates for paid lectureships on Geography. This circumstance is not only another indication of the esteem in

which the Society is held, but it also recognises the claims of Geography to more distinct cultivation in our colleges and schools, an allusion to which was made in my last Address.

The notice of our labours will be lightened by the recollection of the very agreeable duty we were called upon to perform by our brethren of the Geographical Society of Paris, who paid this Society the compliment to request that we would present on their behalf three medals with which they had honoured three of our own associates. To Captain McClure a gold medal was awarded for his discovery of the Arctic Channel between the Atlantic and Pacific, commonly called the North-West Passage; to Captain Inglefield a silver medal was awarded for Arctic discoveries in Smith Sound; and to Mr. Galton a silver medal was also given for his African Explorations. These honours were presented at a full meeting of the Society by your Vice-President, Sir Roderick Murchison.

The eighth part of the beautiful Atlas of Physical Geography, by our associate Mr. Alex. Keith Johnston, has appeared; among the entirely new maps in which we may mention with pride Sir Roderick Murchison's Geological Map of Europe.

Dr. Blackie's Imperial Gazetteer has been completed in two large volumes; and Messrs. Fullarton's sixth volume of the Gazetteer of the World has also been published. This great work is nearly concluded, as the seventh and final volume is promised to be ready in the beginning of 1856. Both of these excellent works are to be accompanied by new Atlases.

The English Cyclopædia of Natural History and Geography, by Mr. Charles Knight, continues to be regularly issued.

Mr. A. G. Findlay, already well known by his excellent work on the 'Pacific,' as well as for his various papers in our Journal, has constructed a new Chart of the English Channel with several improvements, including indications of the varying directions of the tides during ebb and flow, &c.

The works of Mr. Laurence Oliphant and Mr. H. Danby Seymour, on the scene of conflict in the East, have been presented to our library.

It is gratifying to observe that all the names just mentioned, are found upon the list of our Society.

A Decimal Compass Card, by Mr. J. M. Share, R.N., has been laid before the Council, and an account of it has appeared in the Proceedings of the Royal Society.

ADMIRALTY SURVEYS.

The Foreign and Colonial Surveys are ten in number: the former comprise the Baltic (where there are two separate parties employed), the Black Sea, China, South Pacific, and the Rio de la Plata; the latter include Canada, Nova Scotia, the West Indies, Cape of Good Hope, and New Zealand.

The Home Surveys are also ten in number, four of which are employed on the coasts of England, three in Scotland, and three in Ireland.

While the greater part of these surveys have been going steadily forward, it will not create surprise that the war in which this country is involved has given an extraordinary impulse to geography, not so much from new surveys by our own officers, but by causing the surveys which have been executed by the Governments of Denmark, Norway, Sweden, Russia, and Prussia, during the last twenty years, to be made better known and more accessible. Many of these at the breaking out of the war were entirely unknown in this country, save in one or two collections, including Manganâ's Atlas of the Black Sea, the Russian survey of the Gulf of Finland, Klint's Coast of Sweden and Bothnia, the coasts of Norway and Lapland, and Lütke's and Reinecke's White Sea and Archangel.

The whole of these works, comprised in not less than 100 sheets, have been re-engraved, and published by the Admiralty within the last eighteen months or two years; and any sheet of them may be purchased for 2s. 6d. These are positive additions to hydrography, of which but for the war we might probably have long remained in ignorance. Not only has an English edition of all these charts been published, but sailing directions for the coasts of Denmark, Sweden, the Baltic, Gulf of Bothnia, coast of Norway, White Sea, Black Sea, and Sea of Azov, have been prepared and freely distributed among our own fleet and that of our Allies. But while the war has suddenly brought these heavy demands on the resources of the Admiralty, the more peaceful labours of hydrography have not been unattended to; and I am informed by Captain Washington that as many as 131,000 copies of plans and charts have been printed and issued by the Hydrographic Department in the course of the last twelve months.

England.—The general survey of the East Coast of England is completed and published on the scale of half-an-inch to a nautic mile; the several harbours, rivers, and roadsteads are given on a scale varying from 4 inches to 20 inches to a mile, according to their importance.

Sheet 3 of the General Chart of the North Sea, which completes the series, has also issued from the Hydrographic Office during the past year.

On the South Coast of England, a portion of the coast of Dorset, the harbour of Lyme Regis, and the river Dart up to Totnes, have been surveyed; also a part of the coast of Cornwall, including the Manacles, Helford river, and Coverack harbour. On the West Coast the Cleddeu river, from Haverfordwest to Milford Haven, has been mapped, and a commencement made on the rivers Taw and Torridge, leading to Bideford and Barnstaple.

Scotland.—On the West Coast of Scotland a portion of the coast of Argyllshire, with Lochs Duich, Long, and Alsh, in Ross-shire have been mapped; and the much-wanted chart of the Great Minch (the intricate passage between Ross and the Hebrides) has been published. On the East Coast the survey of the Frith of Forth has been advanced, and will be completed this year. The Sailing Directions for the North-east Coast of Scotland, forming Part 1 of the North-Sea Pilot, are on the eve of publication.

Ireland.—On the North Shore a portion of the coast of Londonderry, including Port Rush and the river Bann, leading to Coleraine, has been mapped; on the North-west Coast, part of the shore of the county of Donegal; the North Shore of Mayo, from Killala Bay to Broadhaven; and on the South-west Coast, in the county of Kerry, the shore from Ballinskelligs Bay to Sneem in the Kenmare estuary.

Baltic.—Two steam-vessels, under Captains Sullivan and Otter, each with a complete surveying-staff on board, accompanied the fleet to the Baltic last year, and have done the same this season. With the assistance of the Masters of the fleet they surveyed Léd Sound, in the Åland Islands, and the channel by which the ships went up to the capture of the fortress of Bomarsund. They also sounded the anchorage of Barö Sound; and otherwise obtained much hydrographical information, all of which has been published and rendered available for the Baltic fleet of the present season.

Black Sea.—In the Black Sea the surveying staff under Captain Spratt has been equally zealous, and has had more opportunity; it has completed plans of Bourghaz Bay, Varna, of Kustenjeh, and of the Sulina mouth of the Danube, on the western shore of the Black Sea; also of the bay of Kosli, near Bender Erekli, in Asia Minor, where good coal has recently been discovered; with the harbour of Balaklava, Eupatoria, and Kazach and Kamiesh Bays, in the Crimea; and a plan

of the Khersonese peninsula, showing the position of the allied camps and batteries; also a plan of the battle-field of Alma.*

Cape of Good Hope.—The discovery of copper-ore near the mouth of the Orange River has led to the examination of that portion of the western coast of the colony by Commander Nolloth, R.N., of H.M.S. 'Frolic,' a full account of which has recently been published at Cape-Town, with plans of the anchorage. As one of our most distinguished Australian explorers, Sir George Grey, is now Governor of the colony, and Commodore Trotter, well known by his ascent of the Niger, is commander of the naval forces on the station, we may feel certain that if an opening is afforded, all that intelligence, zeal, and energy can do to advance the cause of geography, will assuredly be done.

On the eastern part of the Cape Colony a bank has recently been discovered by Lieut. Dayman, R.N., who is in charge of the Cape survey, off Algoa Bay, about 9 miles E. by S., by compass, from the lighthouse on Cape Recife. In steaming round the bank in H.M.S. 'Hydra,' as closely as the breaking sea would permit, he had one cast of the lead of $9\frac{1}{2}$ fathoms. Lieut. Dayman believes the bank to be that on which the East India ship 'William Pitt' was lost, with all on board, on the night of the 13th December, 1813. It was his intention to make a further examination of the shoal as soon as the state of the sea would allow of it.

China.—Besides some minor additions to our charts, Mr. Richards, of H.M.S. 'Saracen,' and his staff, have completed a fresh survey of the river Min, leading up to the populous town of Fu-chan-fu, the centre of the tea districts, which is now in the hands of the engraver. The demands of the war have led to the publication of a chart of the Sea of Okhotsk, from the Russian surveys; of the peninsula of Kamchatka, of Saghalian Island, and the entrance to the large river Amúr, in Tartary, and the islands of Japan, the greater part of which have only been known in their Russian form, and even in that shape to very few.

South Indian Ocean.—In the now much-frequented track from the Atlantic to Australia, round the Cape of Good Hope, vessels shaping a great-circle course will reach as high a latitude as 53° south, where they are liable to encounter icebergs. This, however, is not the only

* Captain Spratt was formerly employed under our associate Captain Graves in the Survey of the Archipelago; and while on that service he produced his work on Lycia, which, as Colonel Leake has truly observed, "has added very largely to those elucidations of the Geography of Asia Minor, both ancient and modern, which have, from the commencement of the Society, been considered an important object, and have been of the greatest service to science and literature."

danger, as there have been recently discovered some detached islands, which call for caution on the part of the navigator. A group to which the name of Macdonald Islands has been given, from the commander who first reported them, lies between $52^{\circ} 30'$ and $53^{\circ} 10'$ S. lat., and from $72^{\circ} 50'$ to 74° E. long. They would seem to be of volcanic origin; portions of the islands appeared as lofty peaks, visible 50 miles distant; their summits capped with massive clouds, with a block of elevated table-land between. The islands have been reported by four different vessels during the past year, three of which, singularly enough, sighted them within four days of each other, on the 1st, 3rd, and 4th December, 1854. It is still more remarkable that such bold, prominent land should not have been seen before.

Australia.—Seven sheets of the north-eastern portion of the country, including Torres Strait, have been issued by the Hydrographic Office, and a new chart of St. Vincent and Spencer Gulfs, in South Australia.

New Zealand.—The surveying party under Commander Drury have been engaged in Current Basin, French Pass, Sumner Bar, and Waiwaea River. They have added considerably to the soundings off the east coast of the Middle Island, and have examined the rocks called the Traps and the Snakes, off the south extreme of Stewart's Island. It proves that the latter ill deserve their name, as they are bold rocks, rising 470 feet above the sea, and affording an excellent landfall for vessels passing to the southward of the group of New Zealand.

South Pacific.—By the last accounts from Captain Denham, he had just returned from the Fiji and Solomon Islands. In his tracks thither from Sydney, N. S. W., he had been enabled to sweep away some fabulous reefs from our charts of those seas. He had fixed the position of Raoul, a bold island in $177^{\circ} 55'$ west longitude, which rises 1627 feet above the sea-level; and of the North and South Minerva, between which islands he had obtained soundings at the great depth of 967 fathoms, and brought up a specimen of the bottom. He had also made plans of the islands of Moala, Angran, and Ovalaū, in the Fiji group, and obtained some excellent meridian distances, which will enable us to correct the positions of many spots in that portion of the South Pacific. An outline of the whole of his observations is now being printed at the Hydrographic Office, and will be published and generally circulated in a few days, in order to enable geographers at once to correct their charts of those seas.

America.—The return of all our recent Arctic expeditions has enabled the chart of the Arctic regions from Behring Strait to Cape Farewell to be completed; and the chart of the whole of the

north coast of America is now published by the Admiralty. Could we for a moment forget the sad fate of our gallant countrymen, in search of whom these discoveries have chiefly been made, we might view this chart as a proud trophy of the undaunted courage, perseverance, and endurance, under hardships, of our Arctic explorers.

Nova Scotia.—The survey of the deeply-indented coasts of this country is proceeding slowly but surely. Captain Bayfield and his staff are employed near Halifax Harbour, where they have lately completed some important work; and Commander Shortland and his party are in the Bay of Fundy, where the Manan Islands at the entrance of the gulf have occupied them during the past season.

West Indies.—A survey of Caledonia Harbour and Port Escoces, in the isthmus of Darien, has just been completed by Mr. Parsons and his party. The chief interest attached to this survey is, that this port was at one time proposed as the eastern entrance of the contemplated ship-canal across the isthmus. He has also examined the Guincho and Lobos Cays, and the southern part of the Old Bahama Channel, bordering on Cuba.

ORDNANCE SURVEYS.

The discussion upon the progress of the Ordnance Survey in Scotland, more especially with regard to the scales of the surveys and of the published maps, has thus far been determined in favour of surveying populous, cultivated, or mineral districts on the scale of 1 to 2500, or $25\frac{1}{4}$ ($25\cdot344$) inches to a mile, or nearly 1 square inch to 1 acre. The survey is not to be engraved on this scale; but copies made by the anastatic process will be supplied on application, together with reference-books, stating the area of each enclosure.

The Highlands and other partially-cultivated and thinly-peopled districts are to be drawn on the scale of 6 inches to 1 mile. Plans of towns with more than 4000 inhabitants are to be drawn on the scale of 1 to 500, or $126\cdot72$ inches to a mile, or $41\frac{1}{4}$ feet to 1 inch. Copies of these maps are also to be supplied by the anastatic process.

Neither of the maps on these large scales will be engraved; but a general map of Scotland, on the scale of 1 inch to a mile, is to be proceeded with as rapidly as possible.

The survey of Scotland is now in the following state:—Six counties are engraved on the 6-inch scale, viz., Wigton, Kirkcudbright, Edinburgh, Haddington, Fife, Kinross; and the following six counties are drawn on the $25\frac{1}{4}$ -inch scale, viz., Ayr, Dumfries, Renfrew, Linlithgow, Peebles, Berwick.

Colonel James estimates the cost of the survey of Scotland in accordance with the Treasury minute of May 18th ult. ; the area of Scotland assumed to be 30,000 square miles :—

1. For Plans on the scale of 1 to 2500 (assumed for one half of Scotland)	£480,000
2. For Plans of the remainder of Scotland, on the scale of 6 inches to a mile	280,000
3. For the General Map of Scotland, on the scale of 1 inch to a mile, reduced from the large plans	67,000
	<hr/>
	£827,000
Deduct for work already done	150,000
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Total required to complete Scotland	£677,000

The time required for making the survey will depend principally upon the amount of the annual grants. With 70,000*l.* a-year, Colonel James assumes that it can be finished within ten years.

It is to be hoped that the termination of this debate will be followed by the rapid completion of the survey of England, which has been in operation for more than fifty years. Indeed, it has been in hand so long that the earlier sections will require to be resurveyed and re-engraved, in order to represent the numerous changes that have taken place in roads, and other important details, as well as to correct errors of observation which improvements in science have pointed out.

The General Map of England and Wales, on the scale of 1 inch to a mile, still remains unpublished northward of the parallel of Leeds. The survey of the six northern counties has, however, been progressing ; and the counties of Lancashire and Yorkshire are published on the 6-inch scale, while the county of Durham is drawn on the 25-inch scale.

France.—The French Dépôt de la Marine has published several important charts, which have been lately presented to this Society, among which may be particularly mentioned those of the Islands forming the Tuscan Archipelago, Elba, Capraja, Monte Cristo, Giglio, Pianosa, &c. ; and of the neighbouring coasts of the continent as far as Civita Vecchia. These charts are no less remarkable as works of fine engraving than for their useful and minute hydrographical details.

M. Vincendon Dumoulin, with a staff of hydrographical engineers, under Admiral Matthieu, has been employed for several months in executing a detailed survey of the Straits of Gibraltar, and of the adjoining coasts on the Atlantic and Mediterranean. The survey of the African side of the Straits has been recently completed, and the greater portion of the Gut sounded, during which it has been

ascertained that in some points it has a depth of upwards of 2000 fathoms.

The French Hydrographical Survey of the Coasts of Italy will be recommenced in the early part of next month, under the direction of M. Darondeau. This survey has been already completed as far as Porto d'Anzio, with the exception of the small interval between Savona and Bordighera, on the coasts of Western Liguria. During the past year the Charts of the Coast of the Roman States between Civita Vecchia and Porto d'Anzio have been completed; with detailed plans of the Delta of the Tiber as high up as Ostia, and of Porto d'Anzio, as well as of the Port of Genoa, and of the Coast on either side, between Voltri and Portofino.

Surveys of four of the principal Ports of New Caledonia have been sent home by M. T. de Montravel, commanding the French squadron, consisting of the ships 'Constantine' and 'Prony;' who reports the existence at Morare Bay of quantities of the very best coal. Orders have been given to execute a detailed chart of that extensive island.

Viscount Santarem, whose beautiful work on the discoveries of his countrymen the Portuguese, with its splendid illustrations, is well known, continues his work with his accustomed ardour and talent. During the last year he has had prepared a fac-simile of the celebrated Planisphere by the Camaldolese monk Frate Mauro, of Murano, which is now preserved in the Ducal Palace at Venice. The only authentic copy of this curious encyclopædia of geographical knowledge in the early part of the sixteenth century was hitherto in the possession of the East India Company. Viscount Santarem's fac-simile in six large sheets, kindly presented to us by him, is an exact reproduction of the original, and the first that has been published.

Our associate, M. Jomard, is publishing a series of Mediæval Maps and Portulans.

From M. de la Roquette we have received the Introduction to the sixth series of the 'Nouvelles Annales des Voyages,' which, edited by M. V. A. Malte-Brun, will doubtless prove worthy of its established reputation.

Spain.—Among the contributions to the geography of Spain, since the publication of the great Geographical Dictionary of our corresponding member, Señor Madoz, may be cited, the numerous altitudes of several of the most remarkable points, determined barometrically by the distinguished geologist, M. Édouard de Verneuil. The tables which accompany M. de Verneuil's list of heights have annexed to them the geological nature of the localities, the principal

object of his researches. This able man has recently returned to Spain, and is at this moment engaged in mapping geologically the most desolate and uninhabited province of the Peninsula, Marcia.

It is with pleasure that I read in the Bulletin de la Société de Géographie, that the Spanish Government has ordered the construction of a general map of Spain, on the model of the new map of France published by the Dépôt de la Guerre.

Portugal.—Our associate, Mr. J. J. Forrester of Oporto, has published a new edition of his large map of "the Portuguese Douro, extending as far into Spain as the river can be made navigable." This handsome map has been constructed from original surveys, conducted by Mr. Forrester at his own expense, in pursuance of his persevering labours for the development of the resources of our ancient ally, the importance of which has been publicly recognised by the Portuguese authorities. To this object Mr. Forrester has also contributed the work entitled 'The Oliveira Prize Essay on Portugal,' and a topographical map of the wine districts of the Douro. Our library has lately been enriched, through the Earl of Clarendon, by the presentation of the valuable series entitled 'Annales Maritimes e Coloniaes,' published at Lisbon from 1840 to 1846; as well as the chronological index of the discoveries and conquests of the Portuguese from the beginning of the fifteenth century.

Switzerland.—The large trigonometrical survey of Switzerland is in progress, under the superintendence of General Henri Dufour. It is engraving on 25 sheets; and our corresponding member, Mr. Ziegler, has transmitted to us an index map showing the present state of the publication. Mr. Ziegler's communication treats on several interesting details of the survey, and he gives some striking instances of the comparative results of other independent geodetical operations on the French and German frontiers. Mr. Ziegler remarks that the completion of the Swiss survey will render it practicable to carry a line of levels from the Mediterranean and Adriatic across that country to the Atlantic and Baltic, with a view to the investigation of the relative altitudes of the sea in those basins. Another active correspondent of this Society in Switzerland, M. Paul Chaix, is of opinion that a comparison of the Swiss map with those of other European States will show that the vertical system of hill shading, is inferior to the method followed in the Swiss survey.

M. Chaix has been engaged on a detailed survey of the Protestant valleys of Piedmont, near Pignerol, inhabited by the Waldenses. During a recent visit, he was struck with the scanty information on

the existing maps; the scale of the present accurate and elegant Sardinian Staff map, 1 to 250,000, being inadequate for the introduction of the numerous hamlets and dwellings which cover the country. With the assistance of geodetical data, kindly contributed by the chief of the Sardinian Staff, M. Chaix has supplied this topographical detail in a map on the scale of 1 to 70,000; including the names of 495 towns, villages, and hamlets; 15 large valleys; 140 hills, mountain summits, and passes; 121 rivers and rivulets; and the heights of 119 points, 87 of which were measured by himself. The map will be accompanied by text, containing the latest accounts of this interesting seat of the Protestant faith.

Mr. Ziegler announces the completion of the large map of the canton St. Gall, in 16 sheets, and that the new sheets will be transmitted to complete the set presented to us. He also reports the interesting discovery of remains of Celtic buildings, utensils, and arms, exposed on the margin of the Lake of Zürich, near Meilen, during the low fall of the water in the past winter. The Antiquarian Society of Zürich have described the discovery under the title of '*Die Keltischen Pfahlbauten in Schweizerseen beschrieben von Dr. Ferdinand Keller.*' Celtic traces have been found near Massedorf on the same lake, and also in the lakes of Bienné, Neuchatel, Geneva, Wallenstadt, Sempach, and Pfafficon. The positions are indicated on a map transmitted to the Society.

A reduction of the geological map of Switzerland, by MM. Studer and Escher von der Linth, has been published for schools, with emendations from their recent researches. The principle that the study of geography should include a general knowledge of geological structure, is adopted in the system of public instruction under the Cantonal Governments of the Swiss Confederation. With this view, the Canton of Vaud has charged M. de Morlat of Berne to make a compendious translation of Studer's '*Geology of Switzerland.*'

During a visit to Madeira, for the benefit of his health, Mr. Ziegler collected materials and made original observations for a new topographical and physical map of the island, on the ample scale of $\frac{1}{4}$ of an inch to a mile. As a mark of respect to our Society, and recognising the interest of the English public in the island, Mr. Ziegler has requested permission to dedicate the map to this Society; and, bearing in mind the beauty of Mr. Ziegler's previous works, including the collection of maps in his General Atlas, and the great map of St. Gall, this new map of Madeira will doubtless prove to be worthy of his high reputation.

Italy.—The Austrian Government has published four sheets of its large map of Central Italy during the past year, offering great interest to the antiquarian and historian, as embracing the country around Rome, accompanied by a general map of the Roman territory, distinguishing the regions where malaria and intermittent fevers are prevalent.

Since the occupation of Rome by the French, the officers of the staff have also been engaged on a survey of the environs of the Eternal City. It will consist of four large sheets, engraved on stone, and upon the same scale as the great trigonometrical map of France, 1 to 80,000. One sheet has been published, including Rome; the course of the Tiber from Rome to its mouth; the Alban, and a portion of the Volscian and Sabine chains, &c. The other sheets are in progress; and that including Bracciano and Civita Vecchia (South-Western Etruria) will be published in the course of 1855. The more minute topographical details of this, as well as of the Austrian maps above mentioned, have been derived from the accurate Cadastral surveys constructed by the Roman Government. On the French map the height of every important point has been marked; the ancient names of the more remarkable places have been added to the modern ones; the whole under the revision of the eminent Roman antiquarian and topographer, Commander Canina. A map of the country about Rome, in one large sheet, has been recently published there by Piale, and is perhaps the most convenient for the ordinary purposes of the traveller in his explorations of the localities of that classical region.

Ancient Ports and Harbours.—A work on the ancient geography of the environs of Rome has been published lately by Commander Canina in two vols. folio: one, embracing the ancient ports, is of considerable interest in a geographical point of view, as showing the alterations that have occurred during the historical period. The ports of Centum cellæ (Civita Vecchia), Ostia, and Portus Trajani (Porto), with the Delta of the Tiber, Porto d'Anzio (Antium), Astura, and Terracina, are illustrated by detailed plans of great accuracy of their present almost deserted state, with restorations representing what they formerly were, from the descriptions handed down by ancient writers, contemporary documents, such as medals, bas-reliefs, &c. The second volume includes the principal ancient sites of Latium, Etruria, and the Sabina, with maps of each locality. Connected with the same subject we may refer to Canina's work, published in 1854, on the Via Appia, which, in addition to a very accurate survey of that celebrated *Regina Viarum*, in consequence of the excavations executed in 1852-53-54 along it, contains an interesting dissertation on the length of the

ancient mile, and on the itinerary and other measures of length of the ancient standard of the Romans.

My predecessor in this chair, in the annual Address of 1852, had occasion to allude to the geodesic operations contemplated by the Roman Government along this celebrated artery of communication between the capital of the Roman world and its south-eastern provinces. It is well known that under Benedict XIV. the Jesuits Maire and Boscovich had been charged to measure two base-lines, one near Rimini and the other in the environs of Rome, and by means of an intermediate chain of angles to connect these two points, for the purpose of laying down an accurate topographical survey of the Papal States. Considerable doubts had been raised as to the accuracy of the measure of the southern base-line along the Via Appia, and the more so as one of the terminal marks had entirely disappeared. The excavations recently made under the directions of Commander Canina, and at the instigation of the late Minister of Public Works, Jacobini, afforded an opportunity of remeasuring the base-line on the Via Appia,—an operation which has just been completed by Father A. Secchi, Director of the Observatory of the Collegio Romano. The base-line on the Appian is nearly 8 miles long, extending from the tomb of Cæcilia Metella to near Frattocchie, between the 3rd and 11th mile of the ancient enumeration, and its extremities have already been connected with the principal trigonometrical stations about Rome. Padre Secchi is now engaged on the calculation in connection with the measure of the base, and will then proceed to that of the different sides of the angles uniting it with Rimini.

The recalculation of Inghirami's triangulation of Tuscany has been executed by his successor, Padre Antonelli, Director of the Observatory of San Giovannino in Florence. Some doubts had been raised respecting the accuracy of Inghirami's geodesical operations, arising from the discrepancy which their results, relating to the distance between the stations at Piombino and Elba, presented with those of the French surveyors Franchot and Puissant. Padre Antonelli has discovered that these discrepancies arose from an error in Inghirami's computations, and has established the accuracy of his observations. Padre Antonelli's work on the subject is preceded by a detailed biography of Inghirami, late corresponding member of this Society.

The Staff-corps at Turin is continuing the publication of the great map of the continental dominions of the King of Sardinia, which is expected to be completed in the next two years. Sixteen new sheets

of this map have been presented to us through the kind offices of our corresponding member Signor Cristoforo Negri, of the Foreign Office of Turin. The geological survey of the island of Sardinia, by General Alberto la Marmora, is still in progress.

The Papal Government has lately published plans on a large scale of some of its principal towns, including Ancona, Pesaro, Perugia, and Civita Vecchia. Those of Bologna, Urbino, Viterbo, Ferrara, and Ravenna are in progress.

The publication of the maps of the trigonometrical survey of the kingdom of Naples appears to have been interrupted for several years since the death of Cavaliere Amante, the head of the Ufficio Topografico. The King of Naples, however, on the application of the French Government, has consented to allow the French hydrographical surveying expedition, under M. Darondeau, to continue their surveys along his coasts; and it is the intention of that eminent engineer, when he has carried his operations as far as Terracina, to connect them with the Ponza Islands, and perhaps during the present campaign, to carry them as far as the headland of Gaeta, and hereafter to the extremity of the peninsula.

Germany.—The instructive series of volumes on the navigable rivers of Germany, written by Heinrich Meidinger, is now complete, and has been presented by the author to our library. The work is entitled '*Die Deutschen Ströme, in ihren Verkehrs- und Handels-Verhältnissen mit statistischen Uebersichten*;' in four parts, containing the Danube, the Rhine, the Elbe, the Weser, Ems, and Oder.

The topographical surveys of Nassau and another of the Saxon principalities are reported to have been commenced. The Government of Baden have also begun the publication of a map of that territory on the scale of 1 to 200,000.

The travels of Ulrich Jasper Seetzen through Syria, Arabia, and Egypt, in 1802-11, are at length to be published under the superintendence of several German scholars in Berlin. The volumes already issued are entitled '*Reisen durch Syrien, Palästina, Phönicien, die Transjordanländer, Arabia Petraea, und Unter-Egypten, herausg. und commentirt von Prof. Dr. Kruse, in Verbindung mit Dr. Hinrich, Dr. G. Fr. Müller und Mehreren anderen gelehrten.*'

In addition to the Scientific Transactions of various institutions, published in Vienna, Mr. Haidinger has transmitted to us a geological map of the neighbourhood of Krems, on the Danube, by Joh. Czjzek.

Our honorary member, M. de Hammer Purgstall, has presented his

academical treatises on the Camel and on the Arabic names in the Spanish language.

Holland.—Five new sheets of the topographical and military map of the kingdom of the Netherlands, by the officers of the general staff, have been published during the past year, and presented to the Society, together with charts of the coasts of Australia and Java, by the Chevalier Jacob Swart of Amsterdam, our corresponding member. The Royal Institute of Dutch India have also presented several works, specified among our donations, on Borneo, Malacca, and the Dutch possessions, published under its auspices.

Belgium.—The Etablissement Géographique at Brussels, under the able management of our associate M. Van der Maelen, continues its useful labours, among which the 'Carte Administrative et Industrielle de la Belgique,' in 9 sheets, has been added to our collection.

Scandinavia.—The Royal Society of Northern Antiquaries has held its Anniversary Meeting at the palace of Christiansborg, the King of Denmark in the chair, April 29th, 1855. During the last year the learned Secretary, Professor Ch. Rafn, had published a volume of his 'Annales' for 1853, and the 'Tidsskrift' for 1852-53; also a portion of Dr. Egilson's Old Norse Poetical Lexicon. During the year 1853, M. Hammershaimb had visited the Faerøe Islands, and made a map of the Island of Vaagø, as well as of some of the other islands. Magnus Grimsson, of Reykjavik, had sent the first part of his 'Travels in the southern portion of Gullbringu Syssel (or district), and intends furnishing an account of Ingólfs Landnam and the Thingsted on Kjalarnes. Dr. Rink, already so well known for his geographical explorations in Greenland, has presented a new map of Julianehaabs district, besides numerous drawings of remarkable ruins of European buildings in that part of Greenland.

ASIA.

Indian Surveys—Trigonometrical.—The Great Longitudinal Series, extending from the Seronj Base to Kurrachee, is completed. A base of verification has been measured at Kurrachee. The N.W. Himalaya Series, from the Meridional Arc to Peshawur, is also completed, and a base of verification has been measured near Attock. The triangulation along the Indus, to be connected with these two base lines, has been commenced. A Meridional Series from Ragoon, in the Jullender Doab, is in progress. The N.E. Himalaya Longitudinal Series, extending from the Meridional Arc along the foot of the hills to the meridian of Calcutta, is completed; and a base of verification has been

measured at Sonakoda, on the north of that meridian. The triangulation of the Hurilong and Parasnath Meridians is also completed. Thus the entire triangulation of that portion of the Bengal Presidency, from the Meridional Arc to the Meridian of Calcutta, and from latitude 23° to the Himalaya mountains, is finished. A Longitudinal Series, from the Base at Sonakoda to Assam, has been commenced; and the South-coast Series, from Calcutta to Ganjam, to connect with the triangulation of Southern India, is nearly completed. The Bombay Trigonometrical Survey is in progress.

Topographical.—The N.W. Himalaya Survey, comprising the British territory from the Sutlej to the frontier of Ladak, is completed. The Survey of the Peshawur District is also completed. The Rawul Pindee and Jailum Survey, and the Ganjam Survey, are in a forward state. The Survey of the Neilgherries is finished. The Hyderabad Survey, which had been suspended on account of the disturbed state of the country, has been resumed.

Revenue.—These detailed surveys are based upon secondary triangulation, but, when adjusted by the stations of the trigonometrical survey, are perfectly available for incorporation into the Indian Atlas. Nearly the whole of the north-west and central districts of the Bengal Presidency and several of the lower districts are completed. The Survey of the Districts of Mymensing, Rajeshaye, Goalpara, Rohilkund, Bundelkund, Sangor, and Nerbudda districts, the Bori and Rechua Dooabs, are in progress.

Forty-eight sheets of the Indian Atlas have been published, and nine more are now being engraved under the superintendence of our associate, Mr. John Walker, Geographer to the Company.

Marine.—A Survey of the Mouths of the Indus, Coast of Scinde and Kutch, Gulf of Kutch, Bate Harbour, the Bombay Bank of Soundings, the eastern part of Palk's Strait, connecting the coast of India at Point Calimere with the north part of Ceylon, the coast of Pegu and Gulf of Martaban; a new Survey of the Strait of Malacca, the north coast of Sumatra, a Chart of the Arabian Seas, showing the winds and currents during the S.W. monsoon, compiled by Lieut. A. D. Taylor, I.N., have been recently published. A valuable set of Charts, showing the winds and currents for each month in the year, in the Indian and China Seas, the Red Sea, and the Persian Gulf, in 36 sheets, by Lieut. Fergusson, I.N., have lately been sent home.

The members who did me the honour to assist at a late evening meeting at my house, will join with me in acknowledgment of the favour conferred upon us, in the exhibition by Mr. Montgomery Martin of his admirable and instructive relief-model of India.

Tibet and China.—In the course of somewhat multifarious reading I have met with no work which has more agreeably occupied my leisure than the two volumes of Chinese Travel, by the French missionary, M. Hue, which form the supplement to the two before published of his exploration of Tibet. Of their literary merit I think there can be no question: it is such as even a foreigner can appreciate without much distrust of his judgment. M. Hue has the talent of dramatizing his intercourse with the natives of the Celestial Empire, and of throwing into every dialogue the odd combinations and incidents which result from the contact of mandarins and missionaries. He is neither harsh in his judgments nor mordant in his satire; but he has a vein of quiet irony which fills his pages with amusement to the reader. With respect to the more important topic of the value of the information contained in these volumes, M. de la Roquette, late the Secretary and now the Vice-President of the French Geographical Society, writes to the effect, that critics of high character for learning and impartiality are not wanting, who declare that if all pre-existing writings on China were destroyed, and those of MM. Hue and Gabet alone preserved, they would suffice to give a more exact and detailed account of that country, than we possess of the greater part of the countries of Asia. Mr. Walker, Geographer to the East India Company, informs us of the high opinion which Sir John Bowring entertains of the value of M. Hue's statements. In a purely scientific point of view, and considered with reference to the means, the opportunities and purpose of his journey, M. Hue must be regarded rather as an intelligent observer of men, manners, and scenery, than as a contributor to our treasures of accurate geographical data.

According to the Abbé Guillet, M. Krick, and another missionary, *en route* to Lassa, have been lately murdered on the confines of our Indian territories.

Siberia.—It is understood that the Russian Geographical Society is organizing an expedition for the scientific exploration of Eastern Siberia.

Japan.—Among recent events which will take rank in the history of the world, is the revival of intercourse which had been nearly closed for some two centuries, between two principal branches of the family of mankind, in the case of the United States expedition to Japan. The interest which I avow for myself in the concerns of that empire is not a new one. A good many years since I endeavoured to bring them under notice here, by contributing to the 'Quarterly Review' some articles founded on the narratives of the Dutch residents at Nagasaki, then the only European sources of information, Messrs. Meylan, Doeff, and Fischer, whose works in the Dutch language were little, if

at all, known in England. I confess that at that time I saw little prospect of relaxation in the Japanese code of rigid exclusion without the employment of actual force. Neither could I altogether blame the tenacity with which that Government adhered to a system which, whatever its merits, had procured for that singular country two centuries of complete exemption from foreign war and internal convulsion, civil or religious; and had co-existed with a high state of Oriental civilization, and a very successful cultivation of many of the arts of peace. I knew that the limits of Dutch intercourse were gradually being contracted; that the annual visit to Jeddo had been reduced to one every four years; and I did not expect that any mere demonstration of superior power would be sufficient to induce a departure from the rule adopted on the expulsion of the Portuguese and the suppression of Christianity. The scientific information obtained by Commodore Perry and the officers of his squadron in their two visits to Jeddo, in 1853 and 1854, has not yet reached me in any shape; and what I at present know of the expedition is confined to the report submitted to Congress, principally adverting to the diplomatic and political incidents of his dealings with the Japanese. In the outset of this I was pleased to find that a member of our Society had, with permission of the Admiralty, been able to assist Commodore Perry, by placing in his hands a large quantity of charts of the seas in question. Admiral Sir G. Seymour, then in command in the Pacific, was the channel of this international courtesy, cordially bestowed and handsomely acknowledged. During Commodore Perry's movements in the China seas other opportunities occurred, and were not neglected, of cultivating such honourable and friendly relations between these two distinguished services.

With regard to Commodore Perry's observations on the Bonin Islands, however, it is with some little satisfaction, as members of the Geographical Society, we observe, that the first European occupation was by our President-elect, Admiral Beechey, then in command of H.M.S. '*Blossom*;' and that the islands were next visited by our honorary member, Admiral Lütke, of the Russian navy. Captain Coffin, who, according to Commodore Perry, had visited the islands four years before Admiral Beechey, was well known as an Englishman to Mr. Arrowsmith and other geographical friends.

Borneo.—Two illustrated volumes have issued in the course of the last two years from the press of Amsterdam, furnishing very detailed accounts of the rivers of South-eastern Borneo. They are from the pen of Dr. Schwane, formerly a member of the Commission for Natural Science in Dutch India, who in that capacity had, between 1843 and 1847, performed several journeys of exploration in Borneo,

and more particularly one through the heart of the island, from Banjermassin to Pontianak. After a residence in Java, he was on the point of returning to Borneo, in 1851, when death carried him off at Batavia, at the age of thirty-eight. Dr. Schwaner was a native of Mannheim, but had early transferred his services to Holland, and the present work is in the Dutch language. I have not had time to look carefully through these volumes; but from cursory inspection I should imagine that no work has yet appeared containing so much sound information as to the interior of this vast and little-known island; to which the exploits of one of the greatest men of our own or any time, Sir James Brooke, have lately given additional interest.

It will be remembered that, on the recommendation of the Council, Mr. Wallace, upon his return from South America, was kindly provided by the Earl of Clarendon with a free passage to the East; and a communication has since arrived announcing his arrival at Singapore. From Singapore he went to Malacca, where he visited several parts of the interior, including Mount Ophir, which he ascended, and, by means of careful observations with Adie's sympiesometer, ascertained to be 3920 feet above the sea. The mountain is isolated; its summit is almost pure quartz, becoming more or less granitic below; while at the base are highly inclined stratified rocks of a crystalline sandstone.

Adjoining the coast the province of Malacca is flat and swampy, producing rice. Low undulating hills of laterite rise out of these flats, and give an elevated appearance to the country, but they are quite isolated. The general surface becomes more elevated some miles inland, the base of Mount Ophir being, however, only 200 feet above the sea. This central plateau is intersected by wide, flat valleys, gradually contracting towards the interior into narrow winding channels, which seem to connect the low grounds on both coasts of the Peninsula. The charts also indicate the same character in the submarine structure of Malacca Straits. The whole country is a dense jungle.

Returning to Singapore Mr. Wallace met our metallist, Sir James Brooke, who at once offered him every assistance in his power in exploring the territories under his rule. Mr. Wallace writes from Sarawak, that he was much pleased with the appearance of the country, which seemed to offer good facilities for mapping.

AFRICA.

Our meetings for the year have been rich in the results of African exploration.

South Africa.—Dr. Livingston's unparalleled journey from the Cape of Good Hope through the interior has, since the last anniversary, been continued with perfect success as far as Loando in the Portuguese territory on the W. coast. His map arrived here safely, but unfortunately the journals and communications which had been transmitted to the Society through our associate Lieut. Beddingfield, R.N., were lost in the 'Forerunner.' Dr. Livingston had left his friend Sekeletu with 27 men and oxen, as well as a consignment of ivory, entrusted to him by that chief. With this party he ascended the Leeambye and a portion of the Leeba flowing from the northward, as far as the Balonda country, which he found populous and well governed under a powerful chief named Matiamvo. Here the party left the boats and proceeded on oxback. The natives continued to exhibit great kindness as far as the borders of the Portuguese settlements, when exorbitant payments for passage were demanded, in accordance with the practice of these border tribes, which has hitherto effectually obstructed commerce, but which it is hoped will be overruled. After vainly endeavouring to avoid these plunderers, he succeeded in reaching the Quango, where a fortunate meeting with a Portuguese settler obtained him protection till he reached Cassange, in lat. $9^{\circ} 37' 30''$ S. and long. $23^{\circ} 43'$ E. From thence he proceeded without difficulty to Loando, where he was received with unbounded favour and hospitality by the Portuguese authorities and the whole population.

Heavy rain constantly occurred throughout the journey. The whole route passed over a plateau of extreme fertility, well watered, and populous, and great hopes are entertained of its being laid open to commerce and civilisation.

Dr. Livingston has left Loando to return with his party to Sekeletu, with a present of trade goods for that worthy chief from the Portuguese merchants. From thence it was the traveller's intention to follow the Leeambye, in the expectation of reaching Quillimane on the W. coast, where he hoped to find some means of returning to England, and begged that inquiries might be made for him by one of H.M.'s ships on the station.

In connection with Dr. Livingston's adventures, a communication has just been received by the London Missionary Society from his father-in-law, the veteran missionary Robert Moffat, who is stationed at Kuruman, and has spent nearly forty years in S. Africa. Finding that letters and parcels which had been transmitted for Livingston through a native chief had been detained, Mr. Moffat started from Kuruman with supplies for his brave son-in-law in June, 1854, ac-

accompanied by two traders, Messrs. Chapman and Edwards. This journey occupied seven months, and it is alone of great interest, relating to a beautiful, wooded, and well-watered country, occupied by a very powerful chief and warlike people. The dominions of this ruler, named Moselekatse, extend from the river Zambesé southwards, over an immense territory, to the river Limpopo, and eastwards towards the river Shash, a tributary of the Limpopo. It is inhabited by Matabele, or Zulus of the original stock, and by several other tribes, including the Bakone on the S., the Mashona on the N., the Batonga, &c. The town of Matlokoitloko in the Mashona country, where Moselekatse was residing, is 10 days to the southward of the Zambesé river. The Mashona speak the language of the Makalaka, a dialect of the Sechuana, which was reduced to a written form by Mr. Moffat, who has also translated and printed the Bible in that widely-spread tongue. Mr. Moffat succeeded in forwarding the supplies for Dr. Livingston to his friend Sekeletu at Linyante. He learned that the traveller was still on his journey to the W. coast, and was expected to return when the summer rains commenced. Mr. Moffat established the most friendly relations with Moselekatse, who could scarcely be persuaded to part with him, and at last gave him an escort and supplies for the entire journey to Kuruman. Further accounts of this interesting journey will, we hope, be made known from Mr. Moffat's journals.

In the South-western portion of the continent, Mr. Andersson, the companion of Mr. Galton, has continued with much success his explorations of the interior. The narrative we have received from him commences from Tunobis, in lat. $21^{\circ} 55' S.$, long. $21^{\circ} 1' E.$, which he had reached with Mr. Galton in 1852. A journey of some 200 miles, performed in 77 hours, brought him to the lake N'gami. The 77 hours must be understood as the time occupied in actual movement, principally through a dense thorn forest; for at Kolis, one of the five watering-places on the road, he was laid up for a fortnight by a wound received in collision with a black rhinoceros: "*cosas d'Africa!*" After nearly accomplishing a circuit of the lake, he, with the assistance of the native tribes, with whom he seems to have preserved the best relations, ascended for 13 days, the quiet and reedy stream of the Tiogé in a N.W. direction. In this time, however, so tortuous is the course of this river, he only made one degree of northing, and was then arrested in his course by the failure of further assistance from the natives, who decamped at his approach. His narrative contains, besides his own researches, some account of a Griqua expedition N. of the

lake, and much important geographical information, particularly as to the Namaqua country, with accurate latitudes of upwards of 60 places on his route.*

Chadda.—Of another expedition I am able to speak with unqualified satisfaction, as a great triumph of forethought, method, and civilised skill. I allude to the voyage of Mr. M'Gregor Laird's screw steamer 'Pleiad' up the Chadda. We have had so much reason to lament the sacrifices by which the knowledge attained of this part of Africa has been purchased, that our satisfaction with the scientific results of the present adventure has been immensely increased by the actual presence among us, in sound condition, of our associates, Dr. Baikie and Mr. May, who bear witness to the fact that, by a judicious selection of season and other precautions, it has been accomplished, not only without loss of life, but without serious injury to health. I may claim for this Society, and more especially for our late President, Sir R. Murchison, the credit for the origin and continued support to this expedition, which, under the patronage of the Earl of Clarendon, has been brought to such a successful issue. As an experiment and an example it is difficult to calculate its value. In regard to actual results, that value is considerable. Two hundred and fifty miles of the course of the Chadda, above the town of Dagbo, reached by Allen and Oldfield, have been added to our maps. Friendly intercourse with the natives has been established, with much promise for commerce and philanthropy, and much geographical and other information obtained as to the countries and tribes of the interior. This admirably-conducted expedition occupied about four months, from the 12th July to the 7th November. This signal and encouraging success is mainly due to the skill and care of Dr. Baikie, surgeon R.N., on whom the command of the expedition devolved in consequence of the lamented death of Mr. Consul Beecroft. Dr. Baikie's observations will shortly be published, together with a chart of the river by Mr. May, R.N., who accompanied Dr. Baikie as a volunteer by permission of his commanding officer, our associate, Captain Miller, R.N., and made the survey of this great navigable stream for some 600 miles of its course.

Portuguese Explorations.—In the earliest stage of this day's proceedings—the presentation of Dr. Livingston's medal—I adverted to

* From a communication just received, Mr. Andersson is informed of the arrival at Lake N'gami of Mr. F. Green, with a boat, in addition to the ordinary equipments of waggons, cattle, guns, stores, &c. Mr. Green's object is to penetrate the rivers to the northward of the lake, with a view to ascertain whether they reach the coast.

the diary of a Portuguese expedition of 1832, of interior exploration in Africa. This curious volume, prepared by Major Gamitto, second in command of the expedition, has been lately published at Lisbon, under the direction of Viscount Sa da Bandeira, and the patronage of one distinguished among the sovereigns of Europe for accomplishments in science and literature—the young King of Portugal. The expedition, commanded by Colonel Monteiro, and military in respect of numbers and equipments, penetrated from Tété, on the river Zambesé, about 23° S. lat., to the Cazembe territory, towards Lake Mufo, near Lunala, which it reached. The various tribes on the route are minutely described, and the descriptions are illustrated by some coloured engravings, which present strong evidence of fidelity. A map appended is unfortunately a mere march route, destitute of latitudes and longitudes. The two officers in charge of the expedition were the only members of the party who could read and write; a compass was the only scientific instrument provided for them; and the expedition must be considered rather as a preparative for further achievement than as affording much addition to geographical knowledge. The distance marched appears to have been some 300 Portuguese leagues, in a direction somewhat to the west of north. Very fertile tracts were traversed, and the communities encountered presented a rather advanced state of barbarous civilization. The author speaks hopefully of future intercourse across the continent between the Portuguese settlements, and repudiates vigorously the slave trade as the great obstacle to discovery and commerce. We may be glad to know that, with such sentiments, he has been appointed to the government of Tété, which has lately been formed into a separate administration.

Burton.—Not long ago, in glancing over the paragraphs of a German newspaper, certainly rather in search and hope of intelligence from the Crimea than from Africa, I stumbled on the pleasant news, brought by a Trieste Lloyd steamer, that Lieut. Burton had returned to Aden in safety from the expedition—which we knew he had planned, but hardly knew that he had attempted—to the Somali peninsula. This was shortly confirmed by a letter from himself to our Secretary, written in a spirit of dauntless joviality, which marks the character of the writer. The importance of his achievement, a visit to Harar, is not to be measured by the time which it occupied. Previously unvisited by Europeans, it was found in many respects to justify the earnest desire entertained by a deceased and distinguished member of this Society, Sir C. Malcolm, for its exploration. Though at no great distance from that torrid coast-line, where few but salamanders can

breathe, its elevation of some 5000 feet gives it the advantage of a comparatively temperate climate. Fortified sufficiently to repel the incursions of mounted savages, and under the rule of a young and very arbitrary sovereign, it is the rude emporium for a considerable traffic in choice products, more particularly coffee.

Lieutenant Burton's return to this country makes it unnecessary to anticipate his own fuller accounts of his achievements. He has unhappily to speak of less pleasant subsequent adventures. Landing again with a party of officers at Berbera, on the Somali coast, he with his party was attacked by robbers. He himself escaped with a severe wound; but one of his gallant companions, Lieutenant Stroyan, of the Indian navy, was killed on the spot. Lieutenant Stroyan, who had joined the Indian navy in 1841, was an officer of great promise, and scientific acquirements, which procured him employment in the survey of the West coast of India, and the rivers of the Punjab. He had volunteered on the exploring expedition, which terminated so soon and so fatally. Lieutenant Speke, another officer attached to the expedition, was also wounded, but has recovered.

The Nile.—A Sardinian merchant, Mr. Brun-Rollet, has returned from the White Nile, where he has established a station called Be-lenia, in 5° N. lat., and beyond which he has reached 3° N. lat. His map and memoir have been submitted to the French Geographical Society, and are in our possession. A portion, published by the French Geographical Society, contains information as to the course and sources of the great river, its affluents, and the ethnology of its banks. The sovereignty of some of these tribes, it appears, is in the hands of sorcerers, or of chiefs who assume that character. Power obtained by imposture has, however, its inconveniences; and in these countries the remedy for a long drought is to rip up the sovereign.

Suez.—The project of uniting the Mediterranean with the Red Sea has been of late warmly advocated by French authorities. M. Lesseps, formerly French consul in Egypt, has received from the Viceroy permission to organise a company for this purpose. Authorities are, however, widely divided as to the benefit likely to be derived from the execution of this project.*

Darfur.—The Bulletin of the Geographical Society of Paris contains an interesting notice of Darfur, gathered from the "djellabs," or native carriers, employed by the merchants for the traffic with that country. Some of the reports of these persons, after all allowance for

* See our *Journal*, vol. xxi. pp. lxxxiii and 88.

exaggeration, are calculated to excite curiosity. They speak of a mountain country south of Darfur which no one, not born in its precincts, is allowed to visit, and which, though tributary to the Sultan of Darfur, he equally respects, in virtue of some hereditary tradition. In another quarter report speaks of the ruins of a city of vast extent. These notices have been carefully collected by M. Cuny with a view to a journey on his own part to Darfur.

The Central African Expedition has been already mentioned, and I have only to add here, that near Kano, Messrs. Barth and Vogel unexpectedly met; and the latter, having been provided by the former with authority from the Sultan of Sakatu, intended to proceed to Adamawa, and return home by way of the Niger.

The original communications from Dr. Barth which have reached us, still remain too incomplete to allow of the investigation due to the importance of the geographical data presumed to have been accumulated during his prolonged absence. An original map has recently arrived of a portion of the Niger below Timbuktu, first traversed by Mungo Park, between the towns of Garo and Say; but no account of the data on which it is constructed is yet given, and the same observation applies to every other part of his routes. The maps of the routes from Katsina to Sakatu and Timbuktu, and from Timbuktu to Garo, as well as from Say back to Sakatu, and subsequently, have not reached the Society. The expected arrival of Dr. Barth will, it is hoped, be followed by the explanations that are necessary to establish the value of his arduous, protracted, and hazardous labours.

Dr. Vogel's observations and data up to his arrival at Kuka, have been received in the most satisfactory order through the Foreign Office, by direction of Lord Clarendon, and are now being examined by Mr. Arrowsmith. His observations include latitude, longitude, and altitude, as well as the temperature, pressure, and humidity of the air. The assistance which Dr. Vogel has derived from his scientific, hardy, and well-disciplined companions, Corporal Church and Private Maguire of the Royal corps of Sappers, has been brought before the Society through the interesting communications which have been read at our evening meetings. The death of Mr. Henry Warrington, to whose experience the expedition has throughout been so much indebted, was alluded to in a note in the last volume of the Journal. He was the son of Colonel Warrington, formerly consul at Tripoli, and became habituated from childhood to the people of Northern Africa. Perfectly familiar with the language and customs of the desert tribes, he possessed considerable personal influence among them. Mr. War-

rington accompanied Dr. Vogel to Kuka, and his untimely death occurred on his return journey, at the well 'El Dibla,' southward of Bilma.

ARCTIC.

Since our last meeting, one remaining subject of anxiety has been removed, by the intelligence received of the safety of Captain Collinson and the 'Enterprise.' Accident led Captain Collinson to follow closely on the track of the 'Investigator;' and the long and arduous toils of himself and comrades, commencing in January, 1849, have added not a little of importance to our geographical knowledge of the Polar Seas. From that date to her reappearance at Valparaiso in September last, all the credit is due to her commander and crew which can be earned by a successful struggle between skill and endurance with the dangers of Arctic seas and the tedium of three winters spent among them.

Since writing the above, I am indebted to Sir George Back for the following particulars of the expedition of Captain Collinson, to which I have just briefly alluded:—

"The safe arrival of the long absent discovery ship in the early part of this month most happily set at rest all anxiety for the gallant men who formed her crew, and, though there is nothing new to relate respecting her extraordinary voyage to that far-distant Polar Sea, yet the very fact of the skill and judgment displayed by Captain Collinson in bringing her home 'unto the haven where they would be,' stands out in such bold relief as to demand some record in this Address of her perilous escapes.

"In July, 1851, the 'Enterprise' was in the pack ice off Point Barrow, and after many interruptions in sailing between the ice and the land, on the 28th of August she had entered Prince of Wales Strait, where a depôt of provisions left by Captain M'Clure was found.

"An attempt to pass through the Strait was frustrated by a compact body of ice, and the remainder of the season was occupied equally fruitlessly in endeavouring to get to the northward. Thus baffled, the ship was laid up for the winter in a well-sheltered spot on Prince Albert's Land, in lat. $71^{\circ} 35' N.$ and long. $117^{\circ} 39' W.$

"Travelling parties were organised during the spring of 1852, and while one under Lieutenant Parks actually reached Melville Island, and consequently went through one passage to Barrow Strait, the others explored several deep bays.

"On the 5th of August the 'Enterprise' was again free, but the

season was such 'a close one' that, by the 13th of September, she had merely penetrated to the head of a deep gulf in lat. $70^{\circ} 25'$ N. and long. 111° W., thus ascertaining the continuity of Victoria, Prince Albert, and Wollaston Lands.

"Entering the Dolphin and Union Strait, and passing the mouth of the Coppermine River, 'after a hazardous navigation, owing to the increasing period of darkness and absolute inutility of the compass, she reached Cambridge Bay on the 26th of the same month,' and remained there for the winter. Ever active in the object of their mission, the usual exploring parties were despatched in every direction, and in lat. $70^{\circ} 3'$ N. and 101° W. long. a cairn erected by Dr. Rae was found, 'from which they obtained the first intimation that any party had preceded them in the search.'

"It is worthy of remark that one of the Esquimaux who visited the ship had in his possession 'a portion of a connecting rod (iron), probably belonging to a steam-engine, as also part of a large metal crutch, on which were faint traces of a broad arrow.'

"Moreover, 'in the course of a visit to the Finlayson Islands, in a bay on the E. side, a fragment of a companion hatchway or door-frame, bearing unequivocal marks of having been fitted from Her Majesty's stores, was found.'

"On the 10th of August, 1853, the ship was liberated from Cambridge Bay, and wormed her devious course through the ice on her unwilling return along the coast, having been far to the eastward of her imprisoned consort of other days, the 'Investigator,' both arrested by the same cause; and after being frequently beset and thwarted, was still denied a clear escape from that encumbered sea.

"On the 12th of September the ship was frozen fast in Camden Bay, which enabled Captain Collinson in the following May to make an excursion to the Romanzof chain of mountains, where he reached a ridge 1600 feet above the sea.

"About the 20th of July, 1854, the 'Enterprise' was sailing to Point Barrow, and arrived there on the 8th of August, and subsequently at Port Clarence on the 21st."

Upon the melancholy subject of Dr. Rae's intelligence of the discovery of the remains of Franklin's expedition, you are aware that, while the relics obtained by him leave no room for doubt or hope as to the main fact, much doubt may exist, and much caution is advisable, as to some of the details gathered through the medium of an Esquimaux interpreter. In the reasonable hope that further light may be thrown on this sad page of Arctic discovery by the agency of the Hudson

Bay Company, I content myself with alluding to the fact that when Dr. Rae procured the intelligence before us, he was himself engaged in adding to our stores by a survey of the west shore of Boothia. Those who meanwhile would speculate on the information extant, will do well to study the report of a most able lecture, delivered in January last at Torquay, by that great and veteran authority the Rev. Dr. Scoresby. One remark I cannot help borrowing from him, that, putting out of question the loss of Franklin's expedition, the rate of mortality on board some 56 vessels employed in 38 years on the search has not exceeded, and taking individual instances has been far below, that of seafaring men lying in our own harbours.

I regret to be able to add nothing to the statement of last year, that Dr. Kane's expedition was last seen at Upernavik on July 20, 1853.

Although we feel no apprehension for the safety of Dr. Kane and his party, that excellent friend of Arctic explorers, Mr. Henry Grinnell of New York, writes to our Secretary that it has been thought advisable to despatch a relief party early rather than late. The United States' Government has therefore fitted out an expedition for the aid of Dr. Kane's party, which will consist of a screw steamer of 250 tons and a clipper bark of 327 tons, with 45 officers and men, commanded by Lieutenant H. J. Hartstene, U.S.N., and provisioned for two years. Dr. Kane will unhappily be disappointed in his search for Franklin, but we wish him the most gratifying success in his attempt to push research towards the Pole. The relief party starts on the 1st of June, and both are expected to return in October.

At one of our recent evening meetings Sir Roderick Murchison laid before us the design for a monument to be erected to the memory of Bellot. The choice of the site in front of Greenwich Hospital seems to me as appropriate as possible. The work itself will be what it should be—simple, durable, and conspicuous.

Count Francesco Miniscalchi Erizzo, a Veronese nobleman and a distinguished philologist, has been engaged for some years on a general review of Arctic discovery, which has just appeared, accompanied by several maps, three of which have been lately presented to the Society through our kind friend Mr. Pentland, who observes that, the Count having paid much attention to the labours of the early Venetian navigators, this part of his work will not be without interest. The rest of his book consists of a careful review of what has been done in more recent times as regards Arctic search, and he has drawn largely from English publications, to which he acknowledges his debt. The object of the author has been to make known to his countrymen, in their own

beautiful language, what has been done on Northern discovery from the earliest periods.

NORTH AMERICA.

British America.—From the 'Canadian Journal of Science' for 1854 we learn that by careful astronomical observations the longitude of Kingston, as hitherto given, has received a correction of nearly 8 minutes. From the same source we learn that Major Lachlan, one of the members of the Canadian Institute, has urged that provision should be made for taking and recording, at different points in Upper Canada, a series of simultaneous meteorological observations. He recommended also, in the second place, the establishment of a simultaneous record of the rise and fall of the great Canadian lakes throughout their whole extent.

A number of large specimens of the ores, marbles, and other natural productions of Canada have been transmitted to the Great Exhibition of Industry at Paris, in charge of Mr. Logan, so deservedly known as a geologist.

Of the Canadian railways upwards of a thousand miles are completed, and more than two thousand miles in addition are more or less advanced.

I have already alluded to the importance of the Mackenzie River in connection with the extension of the whaling-trade through Behring Strait. Nor should the development of communication between the Atlantic and Pacific shores of the British possessions, so warmly advocated by some of our members, be lost sight of. The first step in this direction must be such a reconnoissance of the country to the west of Lake Superior, as the United States have carried out in several directions in their own territory under the adventurous guidance of our medallist Frémont and other talented officers.

The geological survey of Canada proceeds under the able guidance of Messrs. Logan, Murray, and others; but the inaccuracy and defects of the maps, *even of the settled districts*, were found to be so great, that Mr. Logan had to go over the whole ground on foot, and to measure by pacing the distances travelled. The necessity for a good map, after this, needs no further demonstration.

United States.—It is proposed to carry out a topographical survey of the region which intervenes between the head waters of the Mississippi and the Pacific, lying between the 46th and 49th parallels, including a map of the New Washington Territory and passes of the Rocky Mountains as yet but imperfectly surveyed. This is one of the

enterprises which owe their origin to the growing desire for railroad communication between the Atlantic and the Pacific. It is stated that every precaution has been taken to conciliate, or, if necessary, to repel, the Indian tribes on the line; and that the assistance of the Hudson Bay Company may be depended upon in the service of Governor Stevens, the leader of the expedition.

Coast Survey.—Our library has been enriched by an invaluable mass of hydrographical information in Professor Bache's Report for 1853 of the United States Coast Survey. The operations it describes cover submarine ground of great interest to the navigator along the eastern seaboard of the States, from Nantucket to Texas; and, jumping the continent, we find the accomplished surveyors of the States at work along the coast of California, and at the mouth of the Columbia. The difficulties overcome in many portions of these operations—for instance, where the treacherous submarine district of Nantucket has to be mapped without the assistance of sea-marks, along a coast which scarcely elevates itself above the water—will be found well described in this Report, and will be duly estimated by all navigators.

Among recent American publications I know of none more worthy of notice and eulogium than the narrative of the expeditions conducted between 1850 and 1853 by the parties employed on the United States and Mexican Boundary Commission, published at New York, by Mr. John Russell Bartlett. The author divides his narrative into eight distinct journeys, embracing altogether an extent of some 5000 miles of land-travel. His own enumeration and description of them will give the best idea of his perseverance and exertion. The first is from Indianola, the place of disembarkation in Texas, to El Paso del Norte, 850 miles. The second is to the Copper Mines of New Mexico, in the Rocky Mountains, near the Rio Gila. The third to the interior of Sonora and back. The fourth from the Copper Mines, along the boundary-line south of the Gila, to the Rio S. Pedro, and to Guaymas, on the Gulf of California. The fifth, voyage to Mazatlan and Acapulco, and thence to San Francisco. The sixth, journeys in California. The seventh, from San Diego, by the Colorado and Gila rivers, to El Paso del Norte. Lastly, journey through the States of Chihuahua and Durango, and the south-western corner of Texas, to Corpus Christi, on the Gulf of Mexico. The work is an itinerary, minute, as it ought to be, for its purpose of affording information to future emigrants and other travellers. For my own part, I have an affection for a diary; and though I do not intend, nor indeed am much tempted by the author's descriptions, to follow his daring and arduous course, I have read him with much

pleasure. As the work has been published without the assistance of Government, the author has been deterred from the expense of publishing the full amount of his ethnological and other scientific observations. If these were published, philology would be able to add to its list some twenty vocabularies of the fast disappearing aboriginal tribes of this vast and little-known region. One of the collections alone, of several sent home by gentlemen attached to the expedition, is said to have contained specimens of one hundred hitherto undescribed species of North American vertebrated animals. In artistic drawings, mineralogical and botanical collections, the results of this expedition were equally rich. As the expedition was fitted out with all appliances for its essentially scientific purpose, and as Mr. Bartlett had able subordinates, its geographical and geodesical observations were doubtless such as may be supposed from the scientific attainments of our brother geographers of the United States. Without presuming to lecture other Governments on the appropriation of public funds, I may, as a geographer, express my hope that the liberality of the Government of the United States may be extended to the full publication of such stores of science as those accumulated by Mr. Bartlett and his learned and adventurous associates.

With a view of rendering the various proposals for the simplification of weights and measures, now under the consideration of several governments in Europe and America, conducive to the establishment of a uniform and international system, the American Geographical Society has memorialised Congress to take the question into consideration, and to consider the expediency of endeavouring to bring about an international meeting to procure the adoption of uniform standards.

We have received from our associate, Mr. Schoolcraft, his summary narrative of an exploratory expedition to the sources of the Mississippi River in 1820, resumed and completed by the discovery of its origin in Itasca Lake in 1832, together with reports, &c.

Central America.—The establishment of communications between the Atlantic and Pacific, across several parts of the American continent, must continue for a long time to excite enterprise and geographical investigation. The twenty-fourth volume of the *Journal* contains three papers relating to this object. Commander Prevost's narrative describes a part of the operations for the survey of the Isthmus of Darien, undertaken by the British in conjunction with the Governments of France and the United States, at the instigation of Sir Charles Fox and Company. It might have been expected that this powerful combination would have elicited the fullest knowledge of the limited area

selected for survey; but the result has unhappily proved the contrary, involving the loss of several invaluable lives, and the total failure of the expedition.

Our associate, Mr. John Power, of Panama, to whom we are frequently indebted, sent us an original sketch of the route of Captain Prevost's party, drawn by himself from the notes of Mr. Kemmish, C.E., who accompanied the party, and who had started again to explore the country between the Chuquanaque and the Atrato, where level ground was said to exist.

The Government of the United States has handsomely awarded a gold medal to each of the officers, and 100 dollars to each of the crew, of H.M.S. 'Virago,' engaged in rendering assistance to the party from the United States, employed in the Darien expedition under Lieut. Strain.

During the past year an account has been published, by Mr. Trautwine, C.E., of Philadelphia, formerly engaged on the Panama Railway, describing his survey of the Atrato, and the most promising tracks between that river and the coast of the Pacific running parallel to it. He reports that a ship-canal is out of the question, and that even the expense of a canal for steam-boats of only six feet draught would not be justified by the traffic that could be reasonably anticipated.

The completion of the survey of the coasts on both sides of the narrow isthmus extending from Lake Nicaragua to the Gulf of Darien, together with the course and elevation of the rivers and water-parting, still remains a desideratum, and would be a great acquisition to geography and the various interests connected with our science. That insuperable obstacles to a well-conducted exploration, exist within this contracted area, cannot be allowed; nor can the subject be deemed unworthy of effort, although it remains a question with many, whether the freest confluence of the waters of the two oceans, through *any* part of Central America, would, for various reasons, contribute *greatly* to the general interests of the commerce of the world, or offer facilities, except to the coasting-trade of the contiguous territories, and in the development of their natural wealth. Some idea of the resources of Central America may be derived from Mr. Smith's paper on Burica, just published in the twenty-fourth volume of our Journal.

North and south of the isthmus, the establishment of commercial routes, and the extension of settlements from east to west, are giving importance to vast territories yet unoccupied and but little known.

SOUTH AMERICA.

From South America we learn that the old stimulus which has in all ages been an instrument in the hands of Providence for the inquiries of science, the advance of civilization, and the diffusion of population, the *auri sacra fames*, is at work in the rich valley of the Amazon. From Lima we have received detailed notices of an American expedition directed by Mr. Tulbot, which left Callao in January for the Marañon. The accounts of this enterprise, so far as they have reached me, are more remarkable for details of danger from rapids on the Amazon and hardships, than for scientific additions to geographical knowledge; but such parties travelling with such objects, are the pioneers of science, and the presumed mineral wealth of the Amazon and its tributaries bids fair to bring under notice an immense region hitherto little explored.

Some idea of the capacities of the countries drained by the Amazon may be formed from the rough estimate of them to be found in Lieutenant Maury's excellent Address of last year to the American Geographical Society. He calculates that with a population equal to that of Belgium to the square mile, the basin in question would sustain 600 millions of human beings. Such a population, however, would be a niggardly allowance to a temperature of constant fertility through the year, and a soil the average richness of which is computed at four-fold that of Belgium. If we look to facts like these, we may well pause before we assume that the world is in its dotage, or its destinies nearly worked out.

I had occasion last year to hail the appearance of the volume of Lieutenant Herndon, of the United States Navy, describing his descent of the Amazon. I have very lately received its supplement, in the narrative of Lieutenant Gibbon, the companion from whom he parted in the upper waters. It appears to me, on cursory inspection, in all respects a fit companion volume for its excellent predecessor.

The paper by our lamented associate Colonel Lloyd adverts to the line of communication by way of the Amazon and its tributaries. His original survey of the Isthmus of Panama in 1828-9 formed the subject of his paper in the first volume of the Journal, and was the forerunner of the recently completed Panama Railway. His late occupation of the post of Chargé d'Affaires in Bolivia led him to examine the difficult mountain route from Cochabamba to Chimore, leading to the Amazon, which is sometimes taken to avoid the longer sweep of the ordinary traders' route by way of Santa Cruz and the Valley of the Rio Grande.

His report of this route is not favourable; and his opinions of the communication between Bolivia and the Atlantic, by way of the Amazon and its tributaries, seem to be tinged by the various disagreeable circumstances connected with his proceedings. If the immense fertile interior of South America is to be laid open to industry and commerce, it must be through the navigation of its great rivers, which also present direct channels of communication between the Atlantic and the States on the Pacific.

New Granada.—We learn from the last Report of the Secretary of State that of the thirty-six provinces into which the Republic is divided, the maps of twenty have been completed, including Panama, Azuero, Veraguas, and Chiriqui; but these four have not yet been presented. During the present year the provinces of Cauca, Popayan, and Buenaventura are to be surveyed, and then the contract made by the Government with Colonel Codazzi terminates, but the Secretary recommends that his services should be again engaged by the nation to finish the survey of the remaining thirteen provinces.

Peru and Bolivia.—M. de Castelnau, whose geographical labours have been alluded to in former Anniversary Addresses, has recently completed the publication of the detailed itineraries of his journey from the Coast of Brazil to his descent of the Amazon. These itineraries, which are very minute, will prove useful in the construction of maps of South America, when connected with points the position of which has been determined astronomically; for unfortunately all the astronomical observations made during the expedition of which M. de Castelnau was the chief, were lost by the robbery and death of the young savant, M. d'Ossery, by whom they were made. M. de Castelnau is now engaged, aided by several distinguished naturalists, in publishing the Zoological and Botanical portions of his expedition, in doing which he has met with the most liberal encouragement and assistance from the Emperor of the French.

Chile.—Mr. Gaye's great work on Chile, which embraces not only the political but the natural history of that State, and which has been published under the patronage of the Chilean Government, has made considerable progress since it was last noticed from this Chair. The whole of the Zoological and Botanical portions have been completed as well as the maps of the country. Mr. Gaye is now engaged in printing the Meteorological and Magnetical Observations, which will complete a work for which he deserves the greatest praise.

The Government of Chile, finding that the best maps hitherto published of its territory were very incorrect, has recently decided to have

a more accurate survey made, and for this purpose has employed M. Pissis, a French engineer and geologist, assisted by several native officers. M. Pissis has already published the description of the provinces of Santiago and Copiapo, with a list of several geographical positions determined during the survey. He has also remeasured the highest peak of the Andes, the so-called volcano of Aconcagua, which he found to be only 22,296 English feet, instead of 23,910, as deduced from Beechey's and Fitzroy's observations.

AUSTRALIA.

The few remarks that I have had to make respecting this portion of the world have been anticipated under the head of "Our own Labours," and elsewhere in the pages of this Address. From our associate, the Rev. W. B. Clarke, we have received a communication on the Elevations in York Peninsula, derived from barometrical observations made by himself and the late Mr. E. B. Kennedy.

According to Captain Denham, of H.M.S. 'Herald,' the fate of the late Mr. B. Boyd has been definitively ascertained. It appears that he was put to death within a day or two of his capture on the island of Gundalcanu, and the only trace obtained of him by Captain Denham was his tomahawk.

CONCLUSION.

It now only remains for me to solicit your indulgence for the imperfections and shortcomings of the summary I have endeavoured to furnish of the progress of geographical science, enterprise, and discovery during the past year. It will be a consolation to you, as it is to me, to know that this subject and its treatment will be for some time in abler hands: and when I inform you that Admiral Beechey will fill the chair I am about to vacate, it is tantamount to saying that each and every deficiency under which I have laboured will be henceforth supplied; that you will hereafter have no knowledge trimmed and dressed up, and dressed by an indifferent cook, for a special occasion, but the outpourings of sound learning long accumulated and overflowing. I can promise him from experience the assistance and support of able and willing councillors; and I can have little doubt that the missionaries of science, the Livingstons, the Barths, the Burtons, and the Anderssons of his reign, will make it Augustan. There are hopes and prospects which more than diminish any regret I might otherwise feel on vacating, what your indulgence has made, an

easy chair. In some casual reading of that very delightful periodical, the '*Revue des Deux Mondes*,' my eye was lately attracted by an expression which I think very happily illustrates the relative position with respect to science of myself and many others. I may claim to rank among the consumers of science. I may hope that such positions as the one I am about to vacate, may be occasionally held, without serious detriment, by one of that class; but I cannot disguise from myself that as a rule they must be better filled by a master manufacturer of the article; and I have the satisfaction to know that I transfer my functions to a Deacon of the craft.

In addressing many years ago a very eminent assemblage of the British Association at Manchester, I could find no better or truer illustration of my position than that of one who, from the valley of Chamouni or Grindewald, watches the progress of some party scaling the highest summits of the Jungfrau or Mont Blanc. My words were then addressed to men of attainment in all the highest departments of human research. They could not with greater propriety be applied to the Bessels, the Sedgwickes, and the Herschels, by whom I was then surrounded, than to those with whom this Society is specially concerned, and many of whom it counts among its associates—to those who by sea or land are volunteers in the van of the great march of science, civilization, and Christianity—to the Franklins, the Livingstons, the Baikies, Galtons, Anderssons, and Barths, whose achievements it is the object of this Society to watch, to record, and, according to our means, to extol and to reward.

There are some functions which I should, as Vice-President or as a simple Member of the Society, be reluctant altogether to resign; and I have been better able than most men, from mere accidents of residence, to collect together, with the least inconvenience to the greatest number, the members of this and other kindred Societies. If I am not wrong in supposing that such opportunities of occasional intercourse, to use an expression of Lord Stowell, "lubricate the wheels of science," I may hope, the accidents of life permitting, to retain, as a simple member of this Society, the honour, the privilege, and I must add, the singular pleasure to myself, of promoting such intercourse which I have enjoyed as your President.



PAPERS READ

BEFORE THE

ROYAL GEOGRAPHICAL SOCIETY.

I.—*Geographical Notes, taken during a Journey in Persia in 1849 and 1850.* By KEITH E. ABBOTT, Esq., H. M. Consul at Tehrán.

Communicated by the EARL of CLARENDON.

Read, January 8 and 22, 1855.

[It is my purpose in the following pages to describe some parts of a journey performed in the middle and southern countries of Persia in the years 1849-50. My route led me from Tehrán, the present capital of Persia, to Savé, Kúm, Kashán, and Ispahán, and thence to Yezd, Kermán, Shíráz, and Bander Beshír, on the Persian Gulf. From the last place I embarked in an Arab boat and crossed the Gulf to the mouth of the Shut-ul-Arab, as the joint stream of the Tigris and Euphrates is called, and thence proceeded to Mohammeráh and Baghdád by the river. Babylon was visited, and I returned to Tehrán by way of Kermanshá and Hamadán, having occupied about nine months on the journey.

I therefore propose to describe only such parts of the route by land, as have been seldom or never visited by European travellers, or which have been incorrectly laid down in our maps.—K. E. A.]

1. *Route from Tehrán by Savé to Kúm.*

October 2.—Accompanied out of the town by some of my English friends, I quitted Tehrán at 2.25 p.m., my own party consisting of myself and eight servants. My purpose being to visit Savé, I avoided the direct road to Ispahán, and proceeded at first by that of Hamadán. Our direction was about W.S.W. to the village fort called Kalé Nú, situated at about 3 miles from Tehrán, and my friends having taken leave of me, I proceeded on my way, with the prospect before me of a long, lonely, and wearisome journey of many months. At the 6th mile we reached the mound S. of Yáftabád, an artificial elevation of considerable size. Villages appeared in all directions about the plain, in general situated, for the sake of security, within high walls, with groves and gardens extending around them, and the plain more or less cultivated in their vicinity. At the time, the crops having been nearly all gathered

in, the plain presented an appearance sufficiently dreary and sterile. From the mound our direction was S.W. to the village Chehar-danghé at the 7th mile; that of Shah Terré at the 8th, and that of Malekabád at the 10th mile; from whence to the village Behrámad, in a direction S.S.W., is a distance of about two-thirds of a mile. Here I found my baggage spread under a fine witch-elm in a large garden or vineyard, and three baskets of beautiful grapes, being brought as an offering by the gardeners, were speedily disposed of by my party. Fruit is hardly ever unacceptable to Persians, and the quantities they devour would set a sober European aghast were he previously unacquainted with their capacity for such food.

From a building over the gate of this village I obtained the annexed bearings:—

Village of Nussrabád,	distant about	1½	mile	N. 50° W.
" Aleahád,	"	4	"	N. 30 W.
" Turshenbé,	"	4	"	N.
" Guldesté,	"	2	"	N. 20° E.
" Yastabád,	"	4	"	N. 70 E.
" Abdullehabád,	"	2	"	N. 40 E.
" Malekabád,	"	4	"	N. 60 E.
Mount Demavend,	"	"	"	N. 65 E.

The district of Feshavié, in which the above villages are situated, belongs to Tehrán; it contains altogether about 38 villages, is tolerably well watered, and produces a great deal of fruit, principally grapes, musk and water melons, apricots and mulberries, with which it supplies Tehrán, but it is less productive in grain, which is grown principally for the consumption of its own population. The vines on this plain are planted on banks between trenches, and are allowed to grow about 5 feet high in clumps.

October 3.—We were in the saddle at a quarter to seven this morning, and, proceeding S.W., reached at the 2nd mile the village Cossemabád; after which the road, varying in direction from W. to W.S.W., brought us, at the 4th mile, to the village Salian. The only crops then on the ground in this part consisted of cotton, palma Christi, and water-melons in occasional patches. Close beyond Salian we came to the deep bed of the Kerrej, in which at this season there is little water, but during the floods this is a dangerous and difficult ford, and accidents frequently occur. I was therefore pleased to find my acquaintance Hadji Abd-ul-Kerrim, a wealthy inhabitant of Tehrán, superintending the erection of an excellent bridge here at his own expense. The bridge is of brick, and will be composed of three arches, the centre one to have a span of about 50 feet. From thence I proceeded N. by W., passing presently a weather-worn artificial mound and the village Kulmé, situated at the 5th mile; then S.W. by W. to

that of Sultanabad at the 6th mile; and S.W. by S. and S.W. to that of Nussirabad, at a distance of $8\frac{1}{2}$ miles, the villages on the plain around becoming less frequent as we advanced. At the 12th mile we reached, in a direction W.S.W. and S.W. from the last village, that of Rebat Kerrim, a flourishing place of some 300 houses, where we put up. Being on the high road to Hamadán it is a station for caravans, for the use of which there is good accommodation. From this to Feizabad is a distance of 7 *farsachs*, or 28 miles, generally over a parched and desert tract, which we were recommended to traverse during the night, in order to avoid exposure to the great heats in a part where water, if procurable at all, is salt or brackish. We accordingly quitted Rebat Kerrim at ten minutes past 10 p.m., and, by the light of the moon, travelled $1\frac{1}{2}$ mile in a direction of 250° , along a magnificent highway; then $3\frac{1}{2}$ miles at 265° to a ruined caravanserai, overlooking a descent into a valley with a brackish streamlet. As the country here had a bad reputation, we closed up with and escorted our baggage until we got again into open ground. One of my servants pointed out a spot where he had, on a former journey, passed the body of a murdered Shah's messenger, and the rest of the party added their stock of intelligence regarding the dangers of this part of the road. We, however, encountered none but peaceable travellers, who, like ourselves, and from a similar motive, were proceeding over this parched tract by night. From the caravanserai we made $1\frac{1}{2}$ mile in a general direction of 60° , and, crossing the streamlet, ascended again, and proceeded 6 miles between the points 235° and 240° ; after this, between W. and S.W. for $6\frac{1}{2}$ miles, when, quitting the Hamadán road, we commenced a slight descent of $3\frac{1}{2}$ miles to Salmanabad, in direction S.W. This village is inhabited by Turks of the Bayat tribe, who are also found in other parts of the district of Zerend, which we had now entered. It appeared a ruinous place, but has nicely-cultivated land around it, irrigated by brackish water. Two miles beyond it we crossed a dry watercourse by a bridge, and then moved in a direction W. for a short space, then S.W., and again W., in all 3 miles, and alighted at Feizabad, another Turk village, belonging to the Khalej tribe, which occupies much of this district, and from which the latter takes its name of Khalejistan, in addition to that of Zerend. Here also the water is brackish, but this is not the case throughout the district. The houses are generally domed, wood for rafters being scarce. The produce of the fields appears to be confined to barley and wheat, cotton and melons. From this part of the country the mountain of Demavend has a most imposing appearance, standing out in strong relief from the general range, and I could, early in the morning, discover a faint, narrow column

of mist or vapour rising perpendicularly from its cone, giving it the appearance of an active volcano.

Bearings from Feizabad.

Village of Zóvié,	4 miles distant	.. ..	N.N.W.
" Destgherd,	2 "	" "	N.W.
" Ahmedabad,	4 "	" "	N. 70° W.
" Shalgan,	1½ "	" "	S.
" Raspejan,	3 "	" "	N.N.E.

Position of the half-ruined village of Zerend, as pointed out W. 30° S., about 4 miles distant.

October 5.—We were in the saddle at a quarter past 2 A.M., and proceeded, by a clear moonlight, southwards for 1½ mile past the village Shalgan, and then from S.S.W. to S.W. by W., by a good road and gentle ascent over a country frequently intersected by hills. The path afterwards became stony, and at about the 10th mile we commenced a long descent through a hilly country, towards the plain of Savé, which we traversed in a direction S.W. We reached this small and ruinous town at 9.5 A.M., after a ride of nearly seven hours, or about 21 miles, and, on approaching it, were met by some people sent out to welcome me by my friend Meer Hashim Khán, the governor, who gave me a very kind reception. Savé is situated towards the western extremity of a plain of inconsiderable breadth, which towards the E. gradually resolves itself into the *Kevvir*, or salt desert; large patches of which occur at about the 9th mile or so, E. of the town, and narrowing near the Kuh-e-Nemek (Hill of Salt), blends with that of Kúm. The plain is but partially cultivated, and is watered on the southern side by the Kara-chai, a slightly brackish stream flowing E., and having, from the bund or dam of Shah Abbass to near Mujidabad, 13 villages on its banks. The villages, which are far from the river, are ill supplied with water for irrigation, and many of them possess no garden-land at all; but the soil is said to be excellent where it does not run into the Kevvir. The cultivation of the plain is carried on in the most slovenly manner, the land not being even cleared of the small tufts and bushes which abound on it, but, after being watered, is sprinkled with seed, ploughed up, and smoothed over with a wooden drag. The produce is stated to be ten for one. The productions are wheat, barley, rice, cotton, palma Christi, melons, figs, grapes, and pomegranates renowned for their excellence.

The people say that the ancient town of Savé was situated more to the W. of the present site, and that some traces of it exist; they also affirm that this plain was formerly covered by the sea, forming one with the Kevvir of Kúm, and that the subsidence of

the waters was one of the miracles accomplished at the birth of their prophet.

Savé, which, according to Macdonald Kinneir, is the ancient Tubus, is, I think, the most ruinous town I have ever visited, though I could not learn from its ignorant inhabitants the cause of its fallen condition. About two-thirds of the space within its walls are occupied by crumbling buildings and mounds of débris, and the inhabited part, I should imagine, cannot contain more than 300 or 400 houses, tenanted by about 1000 families. It has a small covered-in bazar, consisting of a line of about 50 shops, where various petty crafts are carried on, and provisions sold. It possesses no commerce, not even one of transit, as the caravans which frequent this road do not enter the town.

I was shown a large domed building, which is said to be nearly in the centre of the area within the walls, but it now stands alone beyond the inhabited part. It is called the Chehar Su, and possesses a reservoir of filthy water. Internally it had been handsomely decorated with lacquered tiling, and measures in diameter 23 ordinary paces, or about 46 feet. The only other buildings to be noticed are the remains of a mosque of some pretensions, called the Musjid-e-Jumé, and near it a minaret, formerly highly ornamented. I was afterwards conducted to a manufactory of nitre carried on amidst the ruins. The process is simple. Earth taken from the ruins is allowed to soak in tanks of water; through the bottom the water filters, and escapes into a second reservoir, carrying with it the saline particles it has imbibed from the first process. The soil, particularly that of ruined mud walls, is, in Persia, frequently strongly impregnated with nitre. The water is next removed to caldrons, when it undergoes two boilings, the first of which frees it from most of its impurities, which fall to the bottom and are removed; the second renders it a rich-looking broth, and it is then ladled into large iron caldrons and allowed to cool, when a thick incrustation of nitre takes place; this being removed in a mass, is placed over a pit or vessel, when a certain oil escapes from it.

Bearings taken from Savé.

Village of Bagh-e-Sheikh,	E.S.E.,	about 4 miles distant.
"	Abdulabad,	N. 15° E. " 4 " "
"	Sagherlu,	N. 60° W. " 4 " "
"	Nur-aly Beg,	N. 65° W. " 4 " "
"	Olusgherd,	S. 15° W. " 4 " "
"	Avé (position as pointed out),	S. 30° E. " about 16 miles distant.
"	Bund-e-Shah Abbass (a ruined dam in the hills),	S. 60° W. and 12 miles off.
"	Kuh-e-Nemek,	S. 45° E. 20 miles off.

The above-named bund or dam was built by Shah Abbass for

the collection of the water of the Kara-chai, a small river said to take its rise in the Kuh-e-Zerd, near Burujird, and flowing in a brackish stream to the pool, e-Dellak. The dam is now in a ruinous condition, the water escaping from the bottom. The village of Avé stands on the site of an ancient town of the same name, distant 4 fursacks or 16 miles from Savé, and has been alluded to by the old traveller Marco Polo.*

All that I could learn respecting Avé is, that it is the site of an ancient city, of which some slight traces remain; that it has a mound on which formerly there stood a Guèbre castle; and that the spot is in some degree held in reverence on account of the burial there of certain Mahomedan worthies. Of Marco Polo's story of the three kings no tradition appears to remain. By this account, however, Savé has once boasted of the honour now claimed by Cologne, and possibly such relics might have been transported from this country to the banks of the Rhine in a credulous and bigoted age.

The government of Savé comprehends that of Zerend and Karakan under the general designation of Khalejistan, embracing an extensive tract of country. From an account taken during the reign of Futteh-Aly-Shah, the district of Savé then contained 32 villages, that of Zerend 54, and that of Karakan 39; or in all 125 villages. The names of the villages which I ascertained amounted to 98. Several tribes occupy this country (Khalejistan), residing either in fixed habitations or leading a wandering life. The former are Begdelli, Ajerlu, Beyat, and Khalej; the two last of which are the principal ones. The Eleats or Nomades are mostly of the Shahseven tribe, stated to number in this part about 2000 families, besides which there are likewise a few of the "Arab" tribe.

I remained a day at Savé, and left again early the following morning.

October 6.—Our way led us to the village Bagh-e-Sheikh, situated 5 miles E.S.E. of Savé, and alighting here at a brick caravan-sarai, I obtained the following bearings:—

* "Persia contains a city called Sava, whence the three Magi came to adore Jesus Christ when born at Bethlehem. In that city are buried the three in separate tombs, above which is a square house carefully preserved. Their hearts are still entire, with their hair and beards. One was named Balthazar, the other Gaspar, and the third Melchior. Messer Marco inquired often in that city about these three Magi, but no one could tell him anything, except that they were ancient kings who were there buried. They informed him, however, that three days farther was a tower called the Castle of the Fire-worshippers, because the men there venerate fire, and for the following reason:—They say that anciently three kings of that country went to adore a certain prophet newly born, and carried their offerings, gold, incense, and myrrh, to know if he was a king, a god, or a sage: for they said if he took gold, he was a king; if incense, he was a god; if myrrh, he was a sage, &c. One of these kings was of Saba, the other of Ava, and the other of the Castle."

Musjid-e-Jumé, the ruined mosque at Savé	N. 15° W.
Village Harisan on the Kara-chai	S. 25° W.
Kuh-e-Nemek	S.E.
Village, ruins, and mound of Avé	S. 10° W.
(near the foot of the mountains bounding the plain on the S.)	

Thence we travelled to the village Terez Nahid E.S.E., a distance of 4 miles, beyond which the plain presents large patches of kevir, or salt desert, consisting of a light and highly saline soil, almost destitute of vegetation, which on the fall of rain becomes a bog or marsh. On drying it cracks all over and breaks up, as though from the action of the plough, and in this state a horse will generally sink to its fetlocks in it. From Terez Nahid the bearings were S. 25° E. for a short space, then S.E. and S.S.E. to the village and caravanserai of Mujidabad, situated at 17 miles from Savé. The village is a ruin, but the caravanserai is a new and well constructed brick building. From this place I obtained bearings:—

Avé	S. 60° W. 8 miles off
Jáforabad village	S. 25° W. 4 "
Kalunderié ditto	W. 5 N. 2 "
Kunab ditto	W. 10 N. 4 "
Khormabad ditto and its mound	E. 10 S. 1 "
Kalé Seftér ditto	S. 40 E. 4 "
Mehmedabad ditto	S. 30 E. 4 "
Sherifabad ditto	S. 25 E. 3 "
Hyderabad ditto	S. 20 E. 4 "
Dowletabad and Kermabad ditto	S. 5 E. 4 "
Pájian ditto	S. 4 "
Mugulabad ditto	S. 5 W. 4 "
Alcabad ditto	S. 10 W. 3 "
Futtenabad ditto	S. 20 W. 3 "
Tagerud ditto	S. 25 W. 8 "
Kazeran ditto	S. 30 W. 6 "
Seyedabad ditto	S. 30 W. 4 "
Nurabad ditto	S. 35 W. 4 "
Kuh-e-Nemek, hill	S.E. 8 "

This road is much frequented by caravans passing between the northern and southern extremities of the country. Merchandise destined for the south from Kazvin and northwards, or such as comes from the south to any of those parts, would not be carried to Tehrán, but by the more direct road between Kazvin and Kúm, the difference being considerable, about 13 fursacks or 52 miles; thus:—

Kúm to Savé	9 fursacks	} 31
Savé to Kazvin	22 "	
Kúm to Tehrán	22 "	} 44
Tehrán to Kazvin	22 "	
Difference		— 13

October 7.—We were off at 20 minutes to 3 this morning, and proceeding E.S.E., crossed at the 2nd mile the Kara-chai, a paltry

little stream at this part, only about 10 yards wide and a few inches deep. It must be remembered, however, that in its course thus far from the mountains it gives life to many villages, for each of which more or less water is taken off in irrigation. At about the 4th mile we passed to our left the village Kalé Seftér, after which the direction varied between S.E. and E.S.E., until at 8½ miles we reached the Kuh-e-Nemek (Hill of Salt), an isolated rocky mountain, several hundred feet high, from which saline springs issue, form a marsh and pond around, and leave a thick deposit of salt. The interstices and gullies of the hill are likewise full of salt, which appears to impregnate or perhaps forms the interior mass of the hill. Large slabs of this mineral are removed for general use. The hill is a natural curiosity, well worth visiting. It is regarded with superstitious feeling by the natives, who say that "he who goes to it returns not." The probability is that the ascent, at least in parts, may be rendered dangerous by the boggy and infirm nature of the soil, and accidents occurring have given rise to the superstition. I ascended a short distance, but found it so precipitous and slippery, that I could not advance far at that point. Leaving this we proceeded 5 miles in direction S.E., near some low hills, which here interrupted the plain on our left; afterwards the direction became S.E. by E., and then gradually E. by S., along the plain of Kúm, which town, after passing some well-cultivated land and crossing a low bridge over a small stream (the Nalbar), we entered at the end of the 21st mile, the distance from the Kuh-e-Nemek being about 12½ miles.

According to D'Anville, Kúm occupies the site of Choana. Kinnear considers it to have been built in the year of the Hidjra 203, from the ruins of seven towns which composed a small sovereignty under Abd-ul-Rahman, an Arabic prince. I was informed that these towns were called Beravistan, Serajeh, Annabar, Seymereh, Abristejan, Kemidan, Jemkeran; but the names are no longer to be recognised in those of the different divisions of the place, which at present amount to eighteen. Another and more ancient origin, however, is attributed to this town in Persian annals. Savé and Kúm are, according to this account, of the same date, and arose in the reign of Hurshung; Savé was Shehr-e-Pur, and Kúm was Kunb.*

At present the title by which it is known in official documents is Dar-ul-Aman, or place of security; in reference to its sanctuary, the shrine of Fatimeh, the sister of Imám Hussein. Here several of the sovereigns of Persia have been interred, including Shah Seffee, Shah Suliman, Shah Abbass the Second, and Shah Sultan

* Kinnear informs us that Kúm was destroyed by the Afghans when they invaded Persia in 1722.

Hussein, all of the Seffavean line of the present dynasty, Futteh-Aly-Shah and his grandson Mahomed Shah. It is a great resort of Shieh pilgrims, and a place where Mahomedan bigotry is abundantly displayed. A handsome building encloses the shrine, the cupola of which is covered with gilt tiles, the work of Futteh-Aly-Shah; but I was not permitted to enter, a surly seyed warning my conductor that it was against the rules. Adjoining it is a handsome mudresseh, or college, consisting of an oblong court, tastefully planted with trees and shrubs, and surrounded by buildings with four handsome gateways, erected, it is said, by the last-named sovereign in fulfilment of a vow. Adjoining it again is another court and surrounding buildings, consisting of an hospitium and establishment for the sick, built by the same sovereign. A small annual allowance was formerly made from the revenues of the country for the maintenance of this establishment; but at present, beyond the accommodation afforded by the bare apartments, there is no provision for distress or sickness. Kúm appears to be a place of considerable extent, enclosed within walls now in a very dilapidated state, with a ditch outside. Like most Persian towns, a portion of it is in ruins; but I was agreeably disappointed by its appearance and the extent of its bazars, and was informed that it is gradually increasing its population, though the governor, Mirza Fezl-ullah, affirmed that its stationary population does not exceed 12,000 of both sexes. The number of strangers in it, however, is considerable, and 20,000 is by others credibly mentioned as the probable population. I was told there may be 400 shops in its bazars, of which I counted 37, appropriated chiefly to the sale of Manchester goods.

The little stream Annabar-or Nalbar, which flows by its western side, takes a course to the N.E., and is lost in the desert. It is said to have its rise near Burojird at the Kuh-e-Zerd, seven stages off, and on its way passes near Dndehek. Kúm is not at all a commercial or manufacturing town, yet there are about twenty caravanserais, generally small ones, three of which are building, whilst two are undergoing repair, which is a proof of the increasing prosperity of the place. China wares of cheap quality and pottery are made at Kúm, and its jars for cooling water are much esteemed. The climate appears to be salubrious, though very warm in summer, and the harvest is reaped about twenty days earlier than at Tebrán.

The districts belonging to Kúm are not very populous or productive. They extend north and south from Sadrabad 2 fursacks, north of the pool e-Dellak to Shurab about 12 fursacks, and east to west about 7 fursacks; their names are Vazkerud, Komrud, Jasb, and Garpan, containing about thirty-three villages.

Ardebal is a district at present attached to the Government of Kúm, and lying south of the town; but, properly speaking, it

belongs to Kashan. It contains a great many *mezraeh*, or detached cultivated lands, and seven villages: 1. Meshed; 2. Kulejar; 3. Armek; 4. Kermek; 5. Shunek; 6. Sinehghan; 7. Muzvesh. The revenues of the country amount to about 12,000 *tomans* (6000*l.*) in cash, and 4000 *kherwars* of grain, &c., worth say 8000 *tomans* (or 4000*l.*) more. In former times the country of Kúm comprehended the districts of Tafresh, Ferahan, and Kezaz, in addition to those which at present compose it.

The productions of the villages around consist of various fruits, among which is the melon (of superior quality), barley and wheat, rice, cotton, sesame seed, palma Christi, tobacco of inferior quality, and a little good opium; but none of these are largely produced. Rice is not grown every year; but in seasons when, much rain having fallen, there is a prospect of obtaining a sufficiency of water, it is said to be of good quality, as is the cotton. A variety of small tribes, both inhabitants of the town and villages, and of tents, are found in this country; but their numbers appear to be inconsiderable.

I remained less than two days at Kúm; the remainder of the journey to Ispahán is by a well-known route, which I shall not describe.

2. *Route from Ispahán to Yezd.*

November 11.—We were in the saddle at a quarter past twelve, and traversing the Maidan-e-Shah, wound through the bazars, and at a quarter to one got clear of the inhabited part of the town on the side where the remains of its ancient wall are observed, and near to the Kush Khaneh, a government building or palace. To our right, extending over some miles, lay one field of ruins, without an inhabitant, and the transition from a busy bazar to so desolate a spot, in the space of a few minutes, was curious. Our direction lay east along a good road, close to a streamlet flowing in the same direction, and known as the Murgab. Marmots are extremely numerous, but remain so near their holes that they are seldom to be caught. At the end of $5\frac{1}{2}$ miles we reached the village Denun, where I found my baggage and people—the latter and the villagers in full cry at each other, quarters having been refused. I had intended proceeding farther, but was assured there was no habitable place within twenty miles: so, after infinite expenditure of the lungs on both sides, we pacified the villagers and obtained quarters; but neither bread, nor barley for our horses, were to be had, the people declaring that their grain-crops had been destroyed by the destructive insect called *sinn*. The village certainly appeared poor enough, but was the first inhabited one we had reached in the space of nearly six miles, and on every side were scattered far and near the ruins of others. From Denun I took the following bearings:—

Village of Akshu	153*	about 1 mile distant.
" Baharan	170	" 1 "
" Khorasghan	180	" 3 "
" Veshelghban	N.	" $\frac{1}{2}$ "
" Destgherd Kelch ..	340*	" $1\frac{1}{2}$ "
" Khojaveristan	95	" 2 "
" Zemanabad	90	" 1 "
Musjid-e-Shah, Ispahan ..	235.	

This is the district of Gahab, which I am told includes at present 33 villages, and has evidently at some former period been a most populous tract.

November 12.—We travelled over a smooth plain,* where presently all cultivation ceased; and at the 5th mile, entering upon a kevvir or salt tract, we proceeded for $2\frac{1}{2}$ miles across it. Small streams intersecting this plain flow eastward. The surface is white with the salt or soda, and the soil frequently soft and rotten, or firm, but utterly barren. After the 13th mile we reached a fine dry, gravelly tract, free from traces of salt, and with a sprinkling of shrubs and thorns; and here we gave chase to a considerable herd of antelopes. At the end of 20 $\frac{1}{2}$ miles we alighted at the village Vertan, where I was accommodated in an apartment which the owner assured me had been occupied by Mahomed Shah about 9 years before. The villagers stated that his Majesty's troops and suite had plundered them of nearly everything they possessed, and the appearance of the place certainly indicated great poverty. These poor people, however, did not blame their Shah, and the European traveller in Persia cannot fail to remark the general feeling of loyalty which appertains to all classes, and the patience with which oppression and wrong are submitted to. This wretched village contains about 20 families, with some gardens and trees. It is situated in the district of Kuh-pah, and at a bearing of N. 25° E., at a distance of about 5 miles, at the foot of the mountains. Some hot springs of various temperatures are found, covered by a building—as usual, ascribed to Shah Abbass. Nothing can be more dreary than the view from this place, not a village or habitation being visible over a wide extent of plain; the mountains which bound the latter on the N. and S., and running E. and W., are perhaps 40 to 50 miles apart. The district itself contains 19 villages, and extends 12 fursacks E. and W. by 8 N. and S.

* Bearings and Distances.

	Miles.		Miles.
60°	3	60°	1
80	2	70	1
40	2 $\frac{1}{2}$	80 and 90°	9
60	1 $\frac{1}{2}$		—
90	1		20 $\frac{1}{2}$

November 13.—Our path led us in a direction of 100° over a hard, gravelly plain, by a gentle ascent; and towards the end of the 5th mile we passed to our left, at a distance of about 3 miles, the village Zifreh, situated under the mountains at the opening of a valley: at the 6th mile occurred a reservoir of good water, and at the 9th we changed our direction to 90° . Towards the end of the 11th mile we reached the mezraeh Durgheré, consisting of a small plantation of trees and a sheepfold, but no habitation. Here we breakfasted after a cold ride, and, lighting a fire, thawed our benumbed extremities. The path thence led in a direction 90° for $2\frac{1}{2}$ miles, to a second mezraeh, called Karuse, a pretty spot of cultivated land, and trees covering a considerable space; and about two-thirds of a mile beyond brought us to the village Feshark, which I had not expected to reach so soon, the distance from Vertan having been said to be full 5 fursacks, though it really does not exceed 14 miles. I was vexed at making so short a stage, but no spot at which we could procure provisions is found within a reasonable distance beyond it. Feshark is a pretty village of some 50 or 60 houses, situated close under the mountains and surrounded by gardens and groves. Partridges abound. Wheat crops in this part are sown in autumn and reaped in June, yielding six to ten-fold; the ground is then sown with Zohret Seflid (a species of Indian corn). Barley is sown in spring and reaped about the same time as the wheat; but there is a later kind, called sour barley, which had only just been gathered in.

November 14.—From Feshark * the road led in a direction over low hills extending from the foot of the mountains, and, as the direction altered frequently, I give the various bearings, the rate of travelling varying from $3\frac{1}{2}$ to 4 miles per hour. At $5\frac{1}{2}$ miles we reached the hamlet of Jebbel, consisting of a few huts amid gardens and trees. Far off, in a S.E. direction, a long streak of salt kevvir was shining brightly in the sun, and having the appearance of a lake. This is the marsh of Gav-Khaneh, where the waters of the Zaenderud, after passing Ispahan and flowing between two parallel ranges of mountains visible from hence,

* *Bearings and Distances.*

	Miles.		Miles.
130°	$3\frac{1}{2}$	120°	$1\frac{1}{2}$
110 to 120°	1	140	$\frac{1}{2}$
140 to 120	$\frac{2}{3}$	100	$\frac{2}{3}$
140	$1\frac{1}{2}$	110	3
110	$1\frac{1}{2}$	100	$\frac{2}{3}$
140	$\frac{1}{2}$	90	$2\frac{1}{2}$
130	$\frac{3}{4}$		—
120	1		19 $\frac{1}{2}$
100	$\frac{2}{3}$		

are absorbed. The village Kuh-pah, situated in the centre of the plain at some miles distance, bore from hence 170° , and between Jebbel and it are situated 5 mezraehs.

Leaving Jebbel, we soon reached the plain, after gradually receding from the mountains, and at $8\frac{1}{2}$ miles we came to Akhord, another hamlet like the preceding. At a mile beyond was that of Kiki, situated 2 miles on our left; at a similar distance to the E. of which is the village Dakhobad. At $12\frac{1}{2}$ miles we reached Jizzeh, formerly a large village, but now partly in ruins; and at the 16th mile we came to Mush Kynau, a large but very ruinous-looking village. Thence we came, in a direction of 100° for $\frac{2}{3}$ of a mile, and of 90° for $2\frac{1}{2}$ miles, to the hamlet of Tu Dishk, situated at the foot of some hills, which, springing from the main range on the N., extend some 12 miles into the plain in a southerly direction. Distance travelled about 20 miles.

I obtained good accommodation at this little place in a well-built house belonging to Mirza Hussein, khan of Nâin, and to which he resorts in the summer to escape from the heats. Two men came to me here, saying that, having heard that in my country the services of Persians were in requisition, they were anxious to proceed thither in quest of employment, since there was no good to be done by remaining in Persia. I asked what their acquirements might be, to which they replied that they could ride, fight, and plunder, and they seemed to be disappointed in finding that such accomplishments were not greatly in request in England.

November 14.—The morning was bitterly cold, sleet and snow had fallen around us, and the latter continuing with a cold northerly wind and cloudy weather, rendered the ride most disagreeable. At the 1st mile, in an easterly direction, we passed a small mezraeh of three or four huts, and then proceeded through hills, by a slight ascent, gradually bearing to the N. of E., to about 70° to the mezraeh Pa Brehneh, which is a little fort, with a spring of water. Passing this, the road led E. over an open space between hills. At the 5th mile we reached the mezraeh Yezde, after which the road led, by a gentle ascent through hills, in an easterly direction, until the 7th mile, when we commenced a gradual descent in a direction of 130° , passing two more mezraehs situated to our right, the cold obliging us occasionally to alight and walk. At the 9th mile we passed on our right the mezraeh Lar Rudeh, beyond which, at about a fursack distant, is situated the village Mehrabad. At $9\frac{1}{2}$ miles we reached a spot where two roads branched off, one leading to Nâin, the other in a direction of 90° , which latter we followed by an easy descent, still through mountains. At $10\frac{1}{2}$ miles we entered a narrow valley, passing immediately a little mezraeh; and a few hundred yards further

on, another, called Lagheresh, both inhabited and belonging to Náin; the direction was 70° to the latter, then 90° , and 100° to a third at the 12th mile; and afterwards it was 110° to Hadgiabad, a hamlet at the 13th mile. Half a mile lower down the valley, in a direction of 120° , brought us to another Hadgiabad, from whence, between the points 100° and 130° , the path led us to the village Ishretabad, at the 15th mile. The valley, which latterly had widened considerably, opens here into a small uneven plain, in which Ishretabad, with its mound and little fort, is situated. From thence to Eliabad, another small village one mile distant, the direction is 80° .

The mezraehs, which I have so frequently alluded to above, are generally tenanted during the whole year by a few families; in the summer, people from about Náin resort to them for a cooler climate. A mezraeh with inhabitants may be termed a hamlet; without them it is merely a detached spot of cultivated land and groves.

From Eliabad we proceeded eastward towards the great plain of Náin, reaching, at $\frac{1}{4}$ of a mile, the Kaleh Pudaz, a little village and fort, from whence our bearing was 70° for 3 miles, which brought us to the hamlet of Kudannu. Here we were fairly in the plain of Náin (having mountains on our right), the soil of which at this part is hard, dark, and gravelly, and covered with low tufts. Mountains bound it on the N. and S., and at its western extremity. From the above hamlet the direction led in 70° for a short space, then E.—in all $2\frac{1}{4}$ miles; after which, on a bearing of 100° , we reached, at $2\frac{1}{4}$ miles farther on, Bánviz, a desolate-looking village, of some forty or fifty families, where we experienced difficulty in obtaining shelter. Here we found several caravans, which had been detained some days, in fear of proceeding on their way to Yezd, having heard that fifty Bakhtiari horsemen held the road.

From Bánviz there are two roads to Aghdá; one leading by Nu Gumbaz, 3 fursacks off, and thence 9 fursacks to Aghdá; and one by Arakán, a ruinous and uninhabited mezraeh. Nu Gumbaz, which belongs to Aghdá, has a caravanserai, village fort, and tower, but at present no inhabitants. Twelve fursacks make a long stage; and, when danger is apprehended from Bakhtiari or Belúch plunderers, caravans steal along by night, but are frequently plundered on this road.

November 16.—I determined on visiting Náin, though somewhat out of my road.* Proceeding in the direction noted in the

* *Bearings and Distances.*

	Miles.		Miles.
N. 10° E.	$\frac{1}{4}$	290° to Merrach Shah	2
N. 30° E.	$\frac{1}{4}$	Do. to Mahumediéh	$\frac{1}{4}$
N. 20° E. to Bafran	6	270° and 280° to Náin	$1\frac{1}{2}$

bearings, at the 7th mile we reached the small village fort of Bafran, thence Mezraeh Shah at the 9th mile; and $\frac{1}{4}$ a mile beyond to Mahomedieh, a rather large village; we reached Náin at the 10th mile, passing outside it a handsome *Imámzadeh* and a good brick-built caravanseri, the latter of which is, as usual, referred to Shah Abbass. Náin is a small town, rather less than a mile in circumference, enclosed by a dilapidated wall and ruinous ditch, and is entered by five gateways. It is situated on an uneven part of a great plain, a short distance S. of some mountains which intersect the flat country at this part. With the exception of some trifling patches of cultivation and a few gardens of fruit trees, the environs appear perfectly sterile, and the aspect of the place is rendered still more wretched by the ruins of mud-walls which surround it. I was kindly received by the governor, Mirza Seyed-Mahomed-Khan, for whom I had a letter from his superior, Khan Baba-Khan-Serdar, governor of Yezd, but residing at Tehrán. He accompanied me over the place, which possesses a small bazar of some seventy or eighty miserable shops, in which petty trades are carried on, such as smiths, dyers, makers of felt, cotton beaters, &c., and I observed one shop in which Manchester manufactures were sold. The place contains nothing else worth remarking, unless it be the principal mosque, which is built on an unusual plan, and contains an ancient pulpit, bearing the date 721 A.H., that is, 544 years since. A ruined mud fort stands within the town, which latter possesses, according to the governor, some 400 to 500 houses. Its inhabitants speak a dialect of their own, which the governor told me is the ancient language of the Guebres, who occupied this place at no very remote period. Náin is the principal place in a district extending from S.E. to N.W. about 54 miles, and from N.E. to S.W. about 77 miles, in which space there appear to be 8 villages and some 300 mezraehs; many of the latter are hamlets, tenanted each by a very few families. The productions of the district consist of barley, wheat, cotton, all in trifling quantities; and fruits, such as melons, grapes, and pomegranates.

The revenue in this part of the country is taken according to an estimate of the value of the water in the villages or lands. This revenue is called *Bunichéh*, and is of ancient custom. In consequence, I believe, of the difference in the value of money, each toman of *bunichéh* is now reckoned at 15 tomans. Thus the *bunichéh*, or revenue of the Náin district, is 107 tomans = 1605 tomans present value, a miserable sum to be derived from so large a tract of country; but the district, owing to the scarcity of water, is not a fertile one, and it is much exposed to the forays of Bakhtiari and Belúch, by whom, it is stated, 27,000 sheep were last year driven off.

In the evening I returned to Báuviz, with charming weather, when it became a question whether to proceed by night or by day, in consequence of the dangerous state of the road. I should have preferred the former, but my people were all so urgent that I should wait for daylight, saying that, if we were to be attacked, it were better to be by daylight, than I yielded to their wishes.

November 17.—We set out early for the perilous stage, my baggage accompanied by an escort of fifteen matchlock-men, the direction at first on a bearing of 100° , and we had proceeded only a few hundred yards from the village when my greyhounds gave chase to a herd of eight antelopes. After travelling $3\frac{1}{4}$ miles on the Nu Gumbez road, the direction altered to 110° . This plain appears greatest in extent from S.E. to N.W., in both which directions there is a clear horizon, showing that the level country extends far beyond. Its breadth N. and S. is likewise considerable. The road by Arakán (now a ruined place) lies about 6 miles S. of the one we were on. At $5\frac{1}{4}$ miles we reached a spot where two roads occur; one leading to Nu Gumbez, about 6 miles off, in a direction 70° ; and the other, which we took, leading in a direction 120° ; this latter is called the Jádeh Hadji Abdulleh, and is rather more direct than that by Nu Gumbez. At the 10th mile we alighted to breakfast, at a small stream covered in with brickwork, and flowing towards Nu Gumbez; and proceeding again, in direction 130° , we passed the ruined hamlet of Chehar Bashéh, situated at the foot of the hills, some 7 miles S. of the road.

At $10\frac{1}{4}$ miles the road gradually inclined to the E. to 115° , and soon afterwards we traversed an uneven tract, crossing at the 14th mile a little streamlet of intensely salt water, flowing N., and leaving a thick deposit of brine in its course. This point is considered the most dangerous on the road, and only five days previously a party of 25 Bakhtiari horsemen had carried off five laden camels belonging to some unfortunate villagers. Thence our direction was 135° , and soon after, dismissing our guard, the path varied between the above point and 120° . At the 19th mile the direction became—

130° for $1\frac{1}{4}$ mile.

100° to 120° for 1 mile. (*Here an Ab Ambar, or cistern, was passed some 3 miles to our left on the other road.*)

90° to 110° for 2 miles. (*Here we passed $\frac{1}{2}$ a mile S. of a large brick caravanserai and a village fort unoccupied.*)

125° for $1\frac{1}{4}$ miles } *Keveir or Salt Desert.*

110° for $1\frac{1}{4}$ " }

125° for $3\frac{1}{4}$ " } *reach the Mezraeh called Shehrabad, where there are two date trees.*

125° for $2\frac{1}{4}$ miles, reach Aghlá.

The distance is therefore about 33 miles. The caravanserai

and village alluded to above as being unoccupied, were erected by the late Governor of Yezd, Hussein Khan, for the convenience and protection of caravans and travellers, in this otherwise deserted and dangerous tract of country, but his successors have allowed the place to become untenanted. The plain we have travelled over is a hard, dark, gravelly tract, more or less clothed with tufts and low bushes, and abounds in parts with game. Antelopes are numerous; the wild ass is also frequently observed; and we found the Hobara bustard and red-legged partridge.

We alighted at a large new brick-built caravanserai, situated outside the small fort of Aghdá; a very ruinous, mean-looking place, around which a few date-trees are observed. It contains about 300 very poor families; but the adjacent ruins proclaim it to have been a place of more importance in former times. It lies nearly 2 miles north of the mountains bounding the south of the plain. It possesses a few gardens and fields; but the plain is so ill supplied with water, that under present circumstances it appears impossible that cultivation can be carried on to a greater extent, and the aspect of this little place and its environs is wretched in the extreme. The district of Aghdá appears to contain only two other places entitled to the name of village: these are Shemshabad, and Seyed Mahomed, near Aghdá, on the E.; and it has about 12 inhabited mezrahs. The productions are wheat, barley, cotton, excellent pomegranates, figs, grapes, peaches, plums, apples, water and musk melons, and cucumbers. Its revenue is 500 toman. The people of Aghdá say that within the last eight months they have had three encounters with Belúch plunderers, and two with Bakhtiari. About 40 days previously a fight had taken place at Seah Kuh, between 45 Tufenkehee matchlock-men of Aghdá and about the same number of Belúch, though the latter had about 100 men in reserve. The Tufenkehees had possession of a hill when they were attacked by the Belúch, four of whom they killed, and the head of one of them was brought in to the governor of Yezd, who gave a toman (9 shillings) for it. The other three were carried off by the Belúch, as is their custom whenever they are able. We proceeded from Aghdá on a bearing of 110° , passing at the 2nd mile the village Shemshabad, situated on the road-side to our left. At the 7th mile we passed two mezrahs, situated at about 1 mile distant, and $1\frac{1}{2}$ mile to our left, both called Sáv, and from this point the hamlet Arjenan bore S.E., distant some 7 miles. Thence the bearing of the road was 100° till the 10th mile, when we alighted to breakfast at a ruined mezraha called Chífteh, which consists of some enclosed cultivation of wheat and cotton, with fig and mulberry trees; thence 110° to the 11th mile, when we passed between Arjenan, situated $1\frac{1}{2}$ mile S., and two mezrahs, at about as much N. of us.

The road then varied, for $\frac{1}{2}$ of a mile, between 120° and 90° , over low hills; then on a general bearing of 100° , over smooth ground, for $\frac{1}{2}$ mile; 1 mile 130° ; $2\frac{1}{2}$ miles 115° ; from which point, in a direct line south, the mountains we had on our right since quitting Bânviz, terminated in a point; and another range a little south of them extended eastwards, at the time partially covered with snow. To the N., at the distance of a fursack, a tract of salt extends over a space of some miles. We continued on the last bearing one mile, the plain becoming perfectly bare, hardly a tuft being visible on it; then $\frac{1}{2}$ mile 110° , 2 miles 100° . The large village of Feruzabad lies about 2 miles to the N., and at about 7 miles in the same direction is the town Ardekan, to which there is a direct road from Nâin. At the 21st mile was a small, square, deserted fort by the road-side; and at the 22nd mile the bearing was 105° for $\frac{1}{2}$ a mile, with the village Meyjerd 2 miles distant on our left. We then passed near extensive gardens, and at $23\frac{1}{2}$ miles reached Bideh, a village situated on an elevated part of the plain, and possessing a fine tract of field and garden land, on the former of which cotton and green barley were standing. A mile beyond, in direction 110° , brought us to the caravanserai of Meybut. Though I cannot estimate the distance travelled to-day at more than $24\frac{1}{2}$ miles, it is usually reckoned at 9 Arák fursacks. Meybut is a small walled town, containing some 300 to 400 houses, and about 40 shops; it has a ruined ditch, four gates, and a small ark or citadel within it; but it is less ruinous in appearance than either Nâin or Aghdâ, and within its walls there are many gardens. It is the second place in the district; Ardekan, distant 2 fursacks, being the first in importance—a small but flourishing town, inclosed by a wall, and possessing, as I was told, some 600 houses. This fine district, which is termed that of Ardekan and Meybut, belongs to Yezd, and appears to possess 17 villages and 8 hamlets, besides the two principal places above described. The revenues amount to 6500 tomans. Snow does not remain long on this part of the plain; but in winter a dry cold of considerable intensity is experienced. In so arid a country, the heats of summer must be oppressive.

November 19.—Quitting Meybut, we proceeded about a mile, on a bearing of 140° , and then south, through fields of cotton and wheat, for another mile, 130° , which brought us to the hamlet of Shemshabad. One mile beyond, in the same direction, we passed the village of Bedrabad, occupying with its gardens a considerable space. The soil of the plain, for miles past, had altered from a hard dark gravel to a light soft mould, altogether barren, excepting where it is cultivated. At this part it is intersected by numerous water-courses, which give life to the various villages around. Direction, at the 5th mile, 120° , and at the 6th mile 140° , when

we reached the village of Mahomedabad, and left the district of Meybut for that of Rusták. Here the plain is a sandy desert, the sand lying in high banks against the walls of the houses, and in small mounds in every direction. At the 8th mile we again reached a cultivated tract, where the labourers were strewing earth, taken from old mud walls and banks, over the fields to improve the soil. At the 9th mile we passed Ibrahim-abad, a small village to our right. The plain had narrowed considerably for some miles back, and was here of no great width. At 8½ miles the direction altered to 135°, and ½ of a mile beyond to 140°, the sand increasing in depth and extent, and ruins of villages which have been overwhelmed by it. At 9½ miles we passed the village Shemshabad, lying a little to our left, and proceeding on a bearing of 120°, reached that of Izzabad at 10½ miles. The village of Izzabad is gradually undergoing the change which the other villages of this plain have experienced from sand-drifts. On its southern side, the gardens and houses have been buried for the space of above 100 yards in breadth, and to the height of 15 to 20 feet, in a sand of the finest grain. It is now about ten years since the village has been exposed to this calamity, which by degrees is driving the inhabitants in the opposite direction to the drift. Houses are covered to their roofs on one side with sand, but on looking into them one finds them still inhabited. When the wind is strong the people close their doors and windows, and the nearest object becomes invisible outside.

The district of Rusták, likewise belonging to Yezd, yields a revenue of 6080 tomans, and seems to contain about 22 villages and hamlets. It extends about 5 fursacks in length by 2 in breadth, and its productions are similar to those of the adjoining district of Meybut. The land, when sufficiently attended to, is very productive, the crops yielding from 5 to 30 fold; but water is very scarce, and the depredations of the insect *sinn* frequently thwart the labours of the husbandman.

From Izzabad* we proceeded on a bearing of 160°, and presently got off the sand, on to the high road we had quitted yesterday,

* Bearings and Distances.

	Miles.		Miles.
160°	1½	110°	1½
120	½	120	1
100 to 120°	1	110, Ghitflomert	1½
140 to 170	½	150, fort	½
130	½	140	1
120	½	115, Merdabad	2
150, 120°, 100°	½	115 to Keban	1
130 and 100°	½	115 to Yezd	1
110 to Ashkezer	2		
120 and 100° to Zauch	1½		17½

when the direction became 120° , the way leading through well-cultivated land belonging to villages on our right. At the 4th mile occurred the caravanserai of Hemmet-abad, the village itself lying off the road a little to the right; we then traversed sandy desert again, in which sand-hills of considerable size occur. At the 7th mile we passed through the large village of Ashkezer, situated amid sand-hills, and possessing extensive walled gardens; but I could perceive little other cultivation—the sands having also encroached on one side of this village. Thence the road passed over a hard tract again, the plain still decreasing in width as we advanced, and is probably not more than 15 miles across at this part. Towards the 9th mile was the village Zauch, situated $\frac{1}{2}$ a mile to our left, and having near it a remarkable hill called the Takht-e-Jemshid. Its sides are abrupt, and the summit level. Here I was told the district of Rusták terminates. After this sandy desert is again traversed. Beneath the sand is a firm indurated soil. After travelling $11\frac{1}{2}$ miles, we alighted to breakfast at the caravanserai of Gherdfilumerz, or Ghitfilumerz, a village with much neatly-cultivated land amid sand-hills. The preparation of the ground for cultivation in these parts appears to be generally performed with the spade, the soil being soft, fine, and almost destitute of stones, but it requires to be well manured. The productions are such as I have recently noticed. A *jerib* or *khafiz* of land is 90 square Persian yards. One *muns* and a half *shahi* of grain suffice to sow this space; and the produce is from 15 to 35 muns, or 10 to 23 fold, if the land be properly manured; otherwise, it will not return even the seed sown.

At $\frac{1}{2}$ a mile from Ghitfilumerz we passed a small square fort with double wall, belonging to the village Abrendabad, which extends eastward from it, and soon afterwards got upon a hard tract of plain, passing at the 15th mile the village Merdabad, a little off the road to our left. At the 16th mile was the village Kehnú, and that of Nussrabad immediately after, both likewise off the road to the left. On the S.W. and S. side, and almost adjoining the town of Yezd, are the villages Kucheh Beeák, Ser-e-Du Rah, Aristan, Khorem Shah, and Ab Shah; on the E. is Muriabad. I was met by an Istakbal, headed by the Lieutenant-Colonel and other officers of a regiment sent out by the governor to escort me into Yezd,* which city we entered at the end of the 17th mile.

3. Route from Yezd, by Básh and Zerend, to Kermán.

December 7.—I proceeded from Yezd this afternoon, after calling on the Lieut.-Governor, Agha Khan, to thank him for his

* My previous Report to Her Majesty's Government contains a full description of the city of Yezd.

attention and civilities to me, which had been unceasing. As I proposed visiting Taft, the village where felt carpets are manufactured, my route led me, W. 20° S. and W. 10° S., at the end of the 2nd mile, past the village Aristan, situated a little to our right; and adjoining it are Ayeshabad, Kheirabad, and other villages, extending with their gardens from east to west about 2 miles farther. The appearance of the plain on either hand then became utterly sterile to the foot of the mountains before us, our road inclining more to the south (S. 45° W.). At the 7th mile we reached Zeimabad, a village at the foot of the hills, from which the town bears N.E. Passing through the hills, we entered upon a small tract of plain (S. 35° W.), lying between the first and second range. At the 8th mile was the village Cham, at the 9th that of Mubarrekeh, both inhabited by Guebres. At $\frac{1}{2}$ of a mile beyond, we passed that of Hussaiuf. At the end of the 12th mile, after a very warm ride, we entered Taft, a very large village, situated at the foot of the second range of hills, extending up a broad valley, in the wide bed of a mountain torrent, and sheltered amidst gardens and plantations. It belongs to the district of Pish Kuh. I was informed that the number of small felt manufactories in the village was about 30 in all, the number of houses being computed at about 1400 or 1500.

In the neighbouring mountains, $1\frac{1}{2}$ mile south of the village, some caves are found, the deepest of which penetrates about 80 paces into the hill side, but contains nothing remarkable. Lead ore has been obtained here.

From Taft I rode 13 miles nearly due east to Mahomedabad, giving chase on our way to some antelopes. It was during this day's ride that I noticed the soil of the plain to glitter with gold-like particles; and this extends to the hills, 3 miles south of Mahomedabad, where the ravines, gullies, and streams abound with them. I believe them to be only of mica.

From Mahomedabad the road led over a hard, gravelly plain, almost destitute even of wild vegetation. At the 3rd mile ($2\frac{1}{2}$ miles E. 15° S. general bearing; $\frac{1}{4}$ mile E. 5° N.) we crossed the high road to Kermán, which I avoided, as I purposed visiting Bâsk. At the 5th mile (E. 5° N.) we passed the village Khidk, situated a mile to our left, and then proceeded due east to the large village of Fehrej, at the 9th mile. Here we picked up some matchlockmen to protect our baggage, as Belúch robbers are frequently found on this road ($\frac{1}{2}$ mile E. 35° S.; then due E.). The plain became more and more a sandy waste as we proceeded to the foot of the hills, bounding it on the east and extending northwards to the main range, not far distant, and southwards some 4 or 5 miles from the point at which we reached them. At the 18th mile from Mahomedabad, a lofty spur from the southern

portion extends westwards some 3 or 4 miles into the plain. Through the whole of this plain, and on the hills, the gold-like particles, already described, glitter in the sands. We passed through the hills by a broad opening, and reached, at the 19th mile, a cistern of discoloured rainwater. Thence we traversed a plain of no great extent, but less barren than the former, the direction being still due E., until about the 24th mile, when it altered to E. 25° N. 1 mile, $1\frac{1}{2}$ mile E. and E. 10° S. 1 mile, to the little fort Chakáver, held by four matchlockmen, who guard the only well of water, and that brackish, which is found in this desolate region, and from which it is important to cut off Belúch marauders. Here we were obliged to pass the night, having laid in provisions at our last stage, none being procurable here either for man or horse.

December 12.—We were off early, and continuing down the shallow valley we had yesterday entered, the direction varied between E. 15° N. and due E. for the first 5 miles, and we passed a spot called Himám Baba Jemál, where some bushes grow by the side of a salt spring, occasionally the resort of Belúch robbers. We had descended into a plain, which, at this part uneven, extends to a great distance N. and S., and is probably 20 miles in breadth; bounded on its eastern side by high mountains, and on the west by hills of less elevation. As we advanced, a heap of stones was pointed out, as marking the grave of a famous Guebre robber of ancient days, named Fuláh, who, after setting at defiance the authority of the governor for many years, was treacherously put to death by a girl.

The bearings of our road over this uninteresting tract were as follows:—

Miles.		Miles.	
1	E. 15° S.	$1\frac{1}{2}$	S. 30° E.
$1\frac{1}{2}$	E. 20° S.	$1\frac{1}{2}$	S. 50° E. Khaneh Punj.
$\frac{3}{4}$	S.E. by S.		From Khaneh Punj,
$\frac{3}{4}$	E. 20° S.		Báfk bears E.S.E.
1	E. 30° S. Oták Teverku.	4	S.E.
$4\frac{1}{2}$	E. 20° S. and S.E.	$3\frac{1}{2}$	S. E. by E.
$2\frac{1}{2}$	E. 20° S. } Low hills at this	$\frac{1}{2}$	E. by S.
$\frac{1}{2}$	E. 10° S. } part.	$3\frac{1}{2}$	E. to Báfk.
$\frac{1}{2}$	N.E.		
$\frac{1}{2}$	E. 10° N. and E. 20° N., through low hills.	20	

The plain at first was very sparingly sprinkled with tufts and other wild herbs, and was hard and gravelly, the soil sparkling with the mineral. At a little more than the 10th mile we reached some ruinous hovels, called Oták Teverku, without inhabitants. At the 20th mile we came to Khaneh Punj, which consists of a

small caravanserai and a deep covered-in cistern for rain-water, but now dry. The plain is quite deserted, and its well-water is too salt to drink. When formerly a guard was stationed here, water for their use was brought from Báfk, about 12 miles distant.

Leaving Khaneh Punj we soon afterwards entered upon an entirely sterile tract, which presently resolved itself into salt kevvir; and at the 7th mile from Khaneh Punj crossed the nearly dry bed of an intensely salt streamlet, which flows through this plain. On approaching Báfk we traversed a sandy tract, and reaching the town, were paraded from place to place in search of accommodation. I was finally obliged, rather unceremoniously, to take up my quarters at the house of the governor, Mirza Hassan. The whole distance from Chakáver is about 32 miles.

Báfk, a *cassabah*, or small town, containing some 700 houses, is situated towards the eastern side of a great plain, and is, in every sense of the term, an *oasis* in a salt and sandy desert. Its water, which is supplied by twenty-four canals, is slightly salt, but palatable. It is remarkable for its groves of date-trees, in the midst of which it stands, and which occupy a considerable space: scarcely any other tree grows there. On its eastern side, a few small hills rise out of the plain; on the west, the moving sands are encroaching upon it, and have covered the once cultivated lands. It was here that I for the first time had seen any large collection of the date-palm. The plants are male and female, the latter only producing fruit. From the former a large thick sheaf springs from amidst the branches, and in the course of time bursts and discloses a bunch of berries, containing the farina necessary for the impregnation of the fruit-plant, which is done by placing a small sprig of the bunch I have described in the midst of the female tree. The fruit hangs in large bunches from long bare stalks of a reddish, yellow colour, springing from around the head of the trunk; each bunch weighs many pounds, and a good tree will produce as much as 130 lbs. Towards its summit, the stem of the tree is enveloped in a strong and beautiful kind of network of innumerable folds, which covers the lower parts of the branches at their junction, and is with difficulty removed. It is of a reddish brown hue externally, but the inner folds are white and covered with a beautiful glazed pellicle. The tree is long in coming to maturity, probably twenty to thirty years, according to the nature of the soil. The male plant is frequently destroyed to get at what is called the heart, situated near the summit, and which consists of a crisp pulp, agreeable to the taste. One was cut down for me, and I was much interested by a careful examination of the tree, to reach the heart of which was a work of considerable labour, on account of the strong adherence of the net-

work of fibres and their innumerable folds. The root is in shape an inverted cone of no great length, but long fibres, thickly set around it, give the requisite support to its lofty stem. The dates are of two kinds, the common red date, and the black species; the latter is a very delicate, but extremely luscious fruit. The branches are made into brooms, its leaves into mats, its network of fibres into rope. The fruit-branches are elastic, and serve for bows. The stones of the fruit, after being ground, are given as food to sheep and cattle. The fruit serves as one of the principal articles of sustenance to the population, and its heart is eaten as a luxury. The stem, or trunk, is used as rafters, or for fire-wood, and is composed entirely of longitudinal fibres. It is usual to propagate the tree by means of suckers from an old plant; such as are raised from the stone are said not to answer.

The plain and kevvir of Báfk are said to be continuous with those of Kúm, and its district extends from E. to W. about 60 miles—that is, from the village Sheytur to Chakáver, and N. and S. from Ariz to Nehu (both hamlets) about 63 miles.*

The climate is mild in winter, and intensely warm, but salubrious, in summer.

December 14.—*Thermometer, at 8 A.M., 40° in the air. Weather fair and clear.*—The road from Báfk led over a hard, sandy, and gravelly plain.

E.S.E.	for 3½ miles.
E. to E. by S.	" 6 "
E.	" 5 "
S.E. by S.	" 9½ "
E.S.E. and E. by S.	" 4 "
E. by N.	" 1 "
	—
	28½ "

At the 9th mile we proceeded E. towards the mountains, from near which two lines of hills extend into the plain E. and W., the broad space between being occupied by a sandy desert and sand-hills. At about the 14th mile we rounded a point of the hills, and reached some hovels, affording stabling for cattle. The sparkling sand already noticed was still found in this part. Thence the road led through a valley about 2½ miles in breadth, formed on the one hand by the hills we had just reached, which extend many fursacks to the S.E., and on our left by the main range, which I have before noted as bounding the plain of Báfk on the E. Wild tufts and bushes grew abundantly on it, and our way was by a very slight ascent. At about the 28th mile we reached the mountains, and entered a deep recess in them by a wide gorge,

* Its villages and hamlets are given in the Appendix to my General Report. The productions consist of grain, millet, assafetida, cotton, madder-root, Indian corn, dates, and other fruits.

E. by N., through lofty and precipitous rocks. A little farther on we passed through a gateway in a rudely-constructed wall, thrown across the valley as a defence to the village we were approaching, and, passing some cultivated lands in terraces, alighted at the picturesque village of Gudran, at the end of the 29th mile. The houses are built amidst huge masses of fallen rock, and are surrounded by pomegranate, fig, willow, oriental planes, a few palm, and some orange trees. The village is supplied with clear, gushing rills of water, and is altogether a pleasant spot. The villagers are badly off, having little land fit for cultivation.

Thermometer, at 8 P.M., 53° . During to-day's ride we gave chase to some hares of a remarkably small species, which I took at first to be leverets. They quickly took to earth.

December 15.—*Thermometer*, at $7\frac{1}{2}$ A.M., 51° ; $10\frac{1}{2}$, 54° .—Descending again into the plain, we proceeded at first diagonally across it, in direction:—

S.	for 4 miles.	
S.E. by S.	" 1 "	
S.E.	" 2 "	parallel with mountains on either hand.
S.E. by S.	" 2 "	
S. by E.	" 1 "	small caravanserai.
S.S.E.	" 8 "	
S. by E.	" 24 "	
S.E.	" 21 "	
S.S.E.	" 6 "	here a sensible descent.
S.	" 2 "	to salt stream.
S. by E. and presently S.S.E.	} 34 "	
S.E.	" 14 "	road branching off to Noo.
S.S.E.	" 4 "	to Muroyeh.
S.E.	" 3 "	pass Khoda-abad.
S.E.	" 14 "	Serez.

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From the small caravanserai at the 10th mile, the district of Kuh Benan bears E.S.E. in the mountains. Here terminated the district of Yezd, and we entered that of Kermān. At about 214 miles we commenced a sensible descent southwards, and traversed a tract of sand-hills, broken ground, and thickets of the *ghes* tree. Several antelopes and *ti-ku* showed themselves, and, judging from the traces on the sand, this spot must be greatly frequented by game of this kind, and, as I was also informed, by wild asses. At 234 miles occurred a salt stream flowing to the N.W. We reached the little village-fort of Muroyeh at about 284 miles, and, passing the village Khoda-abad at the 30th mile, alighted at that of Serez at 314 miles. This is a ruinous village in two divisions, the water of which is salt.

December 16.—We proceeded to Yezdanabad on the following bearings :—

S.E. by S. and S.E.	.. ..	3 miles	to a wooded spot.
E. 20° S.	.. ..	3 "	to shallow valley.
E. 30° S.	.. ..	3 "	
E. by S. and E.S.E.	.. ..	3 "	
E. 30° S.	.. ..	3 "	
S.E. 10° E.	.. ..	1½ "	to salt stream.
E.S.E.	.. ..	1½ "	
S.E. 20° E.	.. ..	1½ "	
S.E. 10° E.	.. ..	1 "	pass low hills to right.
E. by S.	.. ..	1 "	ascending low hills.
E.S.E.	.. ..	1½ "	ascending low hills.
S.E. by E.	.. ..	1 "	
E. 20° S.	.. ..	1 "	over plain.
E. by S.	.. ..	1 "	
E.S.E.	.. ..	1 "	
E. by S.	.. ..	1 "	
E.S.E.	.. ..	1 "	to Futtehabad.
E. by S.	.. ..	2½ "	
E. by N.	.. ..	1½ "	to Yezdanabad.

24½ miles.

At the 3rd mile were more thickets of the *ghez* tree, after which the plain was, at first, soft and sandy, but afterwards a firm gravelly tract, clothed with tufts and low bushes. At the 6th mile we crossed a shallow valley in the plain, which latter extends from N.W. to S.E. At 11½ miles we alighted to breakfast at a small salt streamlet flowing from E. to W. Here the wild ass is frequently seen. At 3½ miles beyond we passed low hills to our left, rising from the plain, and then crossed a tract of intensely salt kevvir. At about the 21st mile we reached the little ruinous village of Futtehabad, and alighted at Yezdanabad, a village of about thirty-five families, situated rather more than 24 miles from our last station; it in fact comprises two villages, Yezdanabad and Kehnu, called also Izzetabad. Half a mile S. 5° E. of it is a hamlet called Khalkabad, and at the foot of the mountains, 12 miles off, on a bearing E. 10° N., is the village of Tengel. Futtehabad bore W. 5° N., and the position of Kermán, as pointed out, E.S.E. Near this village isolated hills rise on the S.E., E., N.N.E., and N. in the plain. The cultivation around consists of wheat, barley, cotton, and millet.

December 17. Thermometer at 8 A.M. 42°.—On this stage I had the misfortune to discover that my watch had stopped; I therefore could not accurately estimate distances. At about 5 miles from Yezdanabad, travelling east, we reached the small village-fort of Jellalabad, whence the road led E.S.E. to Sulimanabad, another village 4 miles beyond, and, a little farther on, past that of Deh

Chinar. The next was Reyhan, situated at one mile from Zerend (direction still as above to the latter place), a large but ruinous village, situated at what is called 4 fursacks from Yezdanabad, but which I consider only about 10 miles. Zerend is the principal village of a district extending 75 miles N.W. and S.E. and about 45 miles N.E. and S.W. It possesses about fifty villages and hamlets, both on the plain and in the hills.* In the plain the productions consist chiefly of millet, barley, and wheat, cotton, seed of the palma Christi, musk and water-melons, turnips, and carrots; in the hills, wheat, pulse, Indian corn, grapes, walnuts, peaches, pomegranates, fruit of the sweet willows, cucumbers, &c.

In the mountains, 4 fursacks from the village Tograjeh, a lead mine, called Ser-Gheli, is worked near the summit of a hill; the metal is contained in earth and sand, which, after undergoing a washing in seven successive trenches, is smelted on the spot. Some of the earth yields two parts of lead out of twenty-five parts, or about 10 per cent.; but a red sand found there is said to produce 50 per cent. and requires no washing. The Government exacts 10 per cent. of the produce.

Bearings from Zerend.

Village	Keftari, close under mountains, 5 or 6 miles distant,	50°
"	Opang	70
"	Ibrahimabad	135
"	Tajabad	130
"	Muzefferabad	230
"	Kheirabad	245
"	Yezdanabad, situation as pointed out	275

December 18. *Thermometer at 8½ A.M. 36°.*—We departed in bright clear weather, but with a cold easterly wind, and hoar-frost covering the ground. The following are the particulars of the route:—

120°	.. .. .	1½ mile.	
110	.. .. .	1 "	to the village Ibrahimabad.
130	.. .. .	1 "	to Tajabad village, ¼ mile beyond which was that of Bahabad.
130	.. .. .	6½ "	Streamlet and <i>chenar</i> trees, from whence I took the following bearings:—Village Dahu, 4½ miles distant, under mountains, N. 10° E.; village Der Tengeh, 3 miles distant, under mountains, N. 35° E.; hamlet Rigabad, ¼ mile distant, N. 35° E.; village Khanuk, 3 miles distant, under mountains, N. 70° E.
125	.. .. .	5½ "	to Kumabad.
15½ miles.			

* A list of these is sent in the General Report to the Foreign Office.

One of my attendants having succeeded in getting near a small flock under the hills, wounded a wild goat with shot. We also observed eight or ten antelopes. A slight sprinkling of snow, which fell two nights before, was lying in this part of the plain. Kumabad is a small walled village, the last in this direction belonging to Zerend.

December 19. Thermometer at a quarter to 8 A.M. 38½°.—Our direction was as follows:—

S.E.	1½ miles over salt keevir.	
160°	½ "	
S.E.	3 "	
S.E. 5° E. ..	1 "	The mountains bounding the plain on our left make a bend southwards at a point N.E. from this, and extend to 145°, where they form a point. To our right the plain is much interrupted by high and low rocky hills.
S.E.	¾ "	
150°	1 "	across a very salt and sterile keevir, smooth as a carpet.
160° and 150° ..	¾ "	
140 to 120° ..	¾ "	Pass the little uninhabited hamlet of Deh Nu, ¼ mile to our left; from this spot the large village Ser Assiab bears 30° 3 miles distant.
130°	½ "	
155°	½ "	
160°	½ "	parallel with mountains on our left ¼ a mile distant; we here passed the ruined village Mudemabad.
170°	½ "	
150°	½ "	
170°	1¼ "	to village Zungiabad.
<hr/>		
18¾ miles.		

Bearings from Zungiabad.

Village Furreh-abad	1 mile distant, 295°
" Sharokabad (not inhabited)	2¼ " 175
" Ikhtiar-abad	3 " 163
Point of mountains already referred to	3 " 125
Cape or point in the opposite range	6 " 180

Low mountains, farther south than this point, bound the plain on that side, as seen from hence, extending from 180° to 155°, where they rise into a high range N.E. and S.W., sinking again to low mountains at 135° and extending behind (that is S.E. of Kermán) to 125°, when they again rise into a lofty snow-clad range, extending to the N.E. Looking N.W. from Zungiabad, a point or cape rises in the direction of 300°, probably 12 miles off. A small and

isolated range rises in the plain, from 320° to 330° , say 10 miles off, behind which is seen the range we had had on our left, and running at this point about E. and W., though previously about N.W. and S.E.

*December 20. Thermometer at 9 A.M. 51° .—*We proceeded about 13 miles to Kermán, on the following bearings:—

150°	3	nile.	
125 and 130° ..	4½	..	Over smooth plain of very light soil, to rocky
130	2½	..	hills extending into the plain, and through
110	3	..	which we passed near their extremity, which
			forms the point noticed yesterday.
120 and 125° ..	2½	..	Reach a mass of unsightly mud ruins, ex-
			tending to the town of Kermán.
125	1	..	Reach Kermán.
<hr/>			
12½ miles.			

4. Route from Kermán to Khubbes, and the Southern Districts of the Country of Kermán to Shiráz.

The Prince Governor of Kermán had not ceased, during my visit, to show me little attentions and civilities, and everything was done to render my stay as agreeable as possible. On my quitting the city a handsome-looking horse was sent me by his Royal Highness, the value of which I returned him in an English double barrelled gun.

On the 6th of January, 1850, I waited on the Prince to take leave and to thank him for all his civilities. He is a man of agreeable manners and cultivated mind, and detained me a considerable while, conversing on the state and prospects of the country. Regarding the former, he stated that the province had been so exhausted and impoverished by the exactions of former governors (especially Fezl Ali Khan) that, unless a remission of taxation were granted, it would be impossible to collect the revenues for the following year; the districts on the East and South are those which have most suffered. Though not a very tender-hearted man, he gave me a shocking account of the poverty to which the unfortunate people have been reduced; and my subsequent observations convinced me that his statements were not exaggerated. One or two instances, which the Prince gave me, will illustrate this. When Fezl Ali Khan, the late governor, wished to reappoint a certain deputy to one of the districts, the latter declined the service, stating that he had already, by the governor's command, wrung from the inhabitants all they had to give, even to the coins and little ornaments commonly worn by the women and

children; and, in another case, an unfortunate villager having been seized with cholera, was heard to thank God for the prospect it afforded him of deliverance from the tax gatherer.

I told the Prince I hoped and believed the days of oppression in Persia were now past, at least for the present; that the prime minister, the Amir Nizám, would never tolerate it, and that this was an earnest of the gradual recovery of the country from its depressed state. I spoke to the Prince also on the subject of the mineral wealth with which the province abounds—especially the turquoise and copper, the former of which would require little outlay, and his Royal Highness readily adopted the idea; but power and authority are of too uncertain duration in this country for anything to be undertaken by private enterprise, and the Government seldom encourages projects of this kind.

Taking leave of the Prince, I proceeded at once on my way to Khubbes, a small town and district which I believe have not been previously visited by any European, and which are strangely misplaced in some of our maps of Persia. Getting clear of the town, I travelled for the first 4 miles across the plain towards the mountains, on the bearings marked in the margin,* and rounding a point in the hills, lost sight of the town and was presently traversing a small plain of sandy, stony soil by a gentle ascent for 5 miles, then entering the district of Kúh-payeh, we crossed low hills to Gúrghez, a poor, dismal-looking village. Here the rain, which had been gathering since the morning, fairly set in. At about the 16th mile, the village of Pushté Shirín was seen, a mile to our left. The whole country, mountains, plain, and valley, the latter of which we were then descending, slopes very considerably towards the E., giving one an idea of a descent towards the sea. Proceeding 3 miles farther in a direction E., through soaking rain, we reached the village Derakht Anjan, where I was comfortably quartered by the chief of the district. The distance from Kermán is called 7 fursacks (in this part the measure has reference to the space which a laden donkey will traverse in about one hour); I make the distance to be about 18 miles.

8th January.—The stormy state of the weather prevented my departure yesterday. I spent my time therefore in arranging my

* *Distances and bearings.*

	Miles.		Miles.
N.N.E.	2	N.E. by E. and E.	1
N. by E.	3	N.N.E.	2
N.E. by N.	1½	N.E.	1
N.N.E. and N.E.	5	E.	3
E.N.E.	1½		
N.E.	1		19½

notes and in obtaining further intelligence regarding the country from my host, who tells me that his grandfather, Taghi Khan, when governor of Kermán, having revolted against Kerrim Khan Vekil, was induced to surrender himself to that monarch, who caused him to be strangled. The weather became bright after the heavy storm of yesterday, and we left Derakht Anjan at 10 minutes to 7 A.M. by an ascent leading E.N.E. towards a deep cleft in the mountains, passing several small hamlets amidst trees and cultivation, and a mound called Deh Shir, excavated for habitations.* We entered the mountains at the 2nd mile by what proved a magnificent pass, but narrow and rough, and having a stream through it, flowing eastward. Our progress here became very slow, owing to the nature of the ground and the windings of the stream obliging us frequently to ford it; the valley occasionally narrowed and led by various bends, noted in the annexed bearings: thickets occupying the banks of the stream give shelter to partridges, which afforded me some amusement. And here I observed a bush, called Derakht Geech, in full leaf, and bearing long slender seed-pods, which are said to be rank poison to animals. I believe it to be a species of azalea. Towards the 6th mile we quitted the main valley and ascended through a narrow ravine leading at first S., but presently S.S.E., and at the 7th mile reached the summit of the ascent, lofty mountains extending on either side, then an easy descent, over rough ground, in direction S.S.E. At 7½ m. the village Foosk was pointed out, to the S.S.W., 4 miles distant. At 8½ m. we entered a narrow ravine, having a limpid streamlet winding through it; and at 9½ m. another clear stream joined it from

* *Distances and bearings.*

Derakht Anjan to Chehar Fursak.

	Miles.		Miles.
E.N.E.	1	S.E. by S.	½
E.N.E. to mouth of Pass . . .	1	S.E. by E.	½
E.S.E.	½	E.S.E.	½
S.E.	½	S.S.E.	½
S.E. by E.	2	S. by E. to summit	½
S. and S.S.E., quit main valley	½	S.S.W., descent	½
To summit of ascent	1	E.S.E. and S.E.	1½
S.S.E. From hence Foosk bore	½	S.S.E. and E.	1½
S.S.W., 4 miles off	½	S.E. by S. and S.E. by E. . .	½
Enter narrow ravine winding	1	S.E.	½
between S.S.E. and S.S.W. . .	½	E. by N.	½
Another stream from the E. . .	1	E.	½
S.E. by E.	½	E.N.E. Reach plain	½
S.E.	½	N.E. by E. to Chehar Fursak	1½
E.S.E.	½		
E., quit main valley and ascend	½		

the S. Here we alighted to breakfast under some chunar trees, besides which I observed barberry, wild figs, pomegranate, and willows. We continued down the valley, which increased in depth and boldness as we advanced; but at 11 m. we quitted it to ascend by a steep and narrow ravine, or gully, in a general direction S.E. by S. The mountains are here composed of limestone, and, indeed, most of the hills we have traversed to-day, appear to be of that formation. About this part they are sprinkled with the wild almond bush and the assafoetida plant: the former growing to the height of 8 or 10 feet; its thinnest branches and twigs are of a pale green, the thicker ones of a dark brown. The assafoetida, of which I saw only the dried plants at this season, resembled, in that state, a withered thistle $3\frac{1}{2}$ to 4 feet in height, but it differs from the latter, on near inspection, in the formation of the heads attached to each branch.

At the 13th mile we reached the summit of the ascent, which, in one part, was very abrupt; and then we made a long descent through a wild, mountainous country, frequently springing in our way the diminutive partridge called *Techoo*. At the 19th mile we reached the plain of *Khubbess*, which place was visible, with its groves of palm trees, in the distance. At about the 21st mile we alighted at the hamlet *Feizabad* (called also *Chehar Fursak*). The distance is reckoned at 7 *Arak fursacks*. *Feizabad* contains 8 or 10 families, and has some palm, orange, fig, pomegranate, myrtle, and other trees about it. I also observed the blackberry and red nightshade (*belladonna*): the berry of the latter is employed as a cure for stomach pains. There are several hamlets around, but all belong to one group, called *Chehar Fursak*, and possess groves of date and other trees. I greatly enjoyed the ride this day, both on account of the sport it afforded me, and the wild, interesting nature of the scenery; the sight also of trees and thickets growing wild, always affords pleasure to the traveller in this dreary country. I believe I am safe in saying that artillery, excepting of the lightest description, could not be brought by the road I traversed this day, excepting by previous laborious engineering; but camels can travel by it. There is another and easier road, however, from *Kermán* to *Khubbess*, which is generally avoided on account of its being frequented by *Behúch* marauders; it leads from *Kermán* to *Dehneh Mazar*, and thence 7 fursacks by a valley to *Dehneh Gar*, a pass to the N.W. of *Khubbess*: guns may be brought by this road.

Before quitting *Feizabad* on the 9th January, I took the following bearings:—

<i>Nasserabad</i> , a hamlet, N.N.E.	$\frac{1}{2}$ mile distant.
<i>Bagh Almass</i> , do., N.E. 10° N.	$\frac{1}{2}$..

Khalisah, hamlet with a tower, N.E. by E. . . . ¼ mile distant.
 Khubbes, E. 15° N. 9* „

The road led by a slight descent, over very rough and stony ground, past the village Kúneran, towards the 4th mile. I observed several plants and bushes on this plain which I have not seen elsewhere, and others, such as geech, tamarisk, and a species of mimosa. As I approached Khubbes, I was met by a small party of matchlockmen and other people, sent out by the governor, Mirza Hussein Khan, to escort me into the place. We passed for a considerable distance through groves of date and orange trees, and alighted at a comfortable lodging belonging to the Kelunter's son, after a short ride of 10¼ miles. The thermometer stood, at 1 P.M., at 57½°.

This is a very charming spot at this season of the year, sheltered as it is amidst dense groves of palm, orange, and lemon trees, the circuit of which may be about 3 miles. They extend in length from N. to S.

Khubbes is a neat-looking village fort, with a *narenj-kaleh*, or little citadel, which, however, is unoccupied. Within the walls dwell about 100 families, and beyond them, scattered far and near amongst the groves, probably 250 more. The site is said to be an ancient one; but the present fort was erected, in late years, by Ibrahim Khan, as a protection to the inhabitants against Belúch marauders, who have occasionally carried their depredations into this and other villages. Immediately around the fort, the space is occupied by fields of grain and henna, for the latter of which Khubbes is noted, as well as for its dates. It possesses neither bazars nor shops, and the appearance of the people was that of great poverty. They, in common with the inhabitants of other parts, have suffered from the extortion of governors. The regular revenue of the district amounts to about 1900*l.*, but this sum is greatly increased by the local government.

The situation of Khubbes is on a dreary-looking plain, on the borders of the Great Desert, at about 14 miles from the mountains on the W., and at the termination of the slant of that length, which is a tract of very stony soil. Scattered at some

* Distances and bearings.

	Miles.		Miles.
S.E. Reach high road	½	E. by N.	1
N.E. and E.N.E.	¾	E.	1
E. by N.	1½	E. by N.	1½
N.E.	1	E. by S.	1½
E. by N.	½	E. by N.	2½
E.	½		10½
Village Kúneran	½		
E.N.E.	½		

Alighted at Khubbes.

D

miles to the E., N.E., and S.E. are numerous small villages, amounting in all to about 43, and forming a line N. and S., composing, with their groves and fields, and thickets of tamarisk, the district of Tekab. Henna, dates, and oranges are the principal productions; but tobacco and rice are also cultivated. It is reckoned that about 75,000 Tabriz mauns of henna are produced there, and 25,000 more in Khubbes, Andujerd, and Keshit. Perhaps the crops may be estimated at half as much more than I have mentioned. The henna is the well-known orange-coloured dye, used by Mahomedans for their hair and beards, a brilliant black being obtained by the addition of indigo leaves to the above colour. The leaf of the henna plant resembles that of the myrtle in shape. The plant grows like a thin, straight twig, about 18 inches in height. The leaves are stripped from it and dried, after which they are ground up and are ready for use. Cold quickly destroys the plant, but it usually yields leaves for six or seven years in succession. The henna of this part is the most esteemed in Persia. The dates are of the black and red kind, and are most delicious: 40,000 female trees are registered for taxes, and the quantity of fruit produced in all the district may amount to 120,000 Tabriz mauns.

The heats in summer are so great at Khubbes, that nearly all its inhabitants forsake the place for higher ground, leaving only a few to look after the cultivation. The poisonous wind, known as the *bad e simur*, rising in the desert, blows for about 40 days in summer, during part of each day, generally an hour before and an hour after noon. Those, who are caught by it in the desert, are frequently destroyed, but it is not fatal where trees abound; and it is affirmed that the dates do not properly ripen without it. During four months of the heats this wind prevails from the direction of Khorassan. The place is well supplied with water from the two streams we passed yesterday, which, after uniting, are conducted to the gardens and groves of Khubbes by canals.

To the N.E. of Khubbes, at a distance of about 12 miles, is situated a tract of salt formed by the deposit of some collection of waters from the mountain torrents, which apparently sweep over an intensely saline soil in their passage. The extent of this deposit is described as being 9 to 12 miles; the salt is several inches in depth, and is carried in slabs for sale to neighbouring places. Eastward of Tekab lies the great desert, extending towards Seistan, an arid waste and wilderness, which neither man nor beast can inhabit.

Caravans from Birjan usually arrive at Khubbes several times in the year; they bring from Khorassan wool, grain, dried fruits, silk, saffron of Ghayn, butter, manna, &c., a great part of which goes on to Bunder Abbassi for India. The caravan returns

from thence usually in April, bringing groceries, spices, indigo, and English cotton manufactures for Khorassan.

To show what an erroneous idea has existed regarding the situation, &c., of Khubbes, I extract the following from Macdonald Kinneir's *Geographical Memoir*:—"About 10 days' journey from Dushak, on the road to Yezd, lies the city of Kubbes, the chief of which acknowledges the nominal authority of Bahram Khan Kyené. For 2 days' journey the road leads over a range of mountains, but for the remaining part of the way over a desert plain. Kubbes is situated in the midst of the desert, 15 days' march from Kermán and 16 from Yezd."

Khubbes is not on the road to Yezd from Dushak, called also Jellalabad, unless the southern route by Boum is taken, which cannot be the one intended; and it is situated at less than 3 days' journey from Kermán (about 45 miles) instead of 15 days' march. Fraser, in his *History of Persia*, talking of the road from Kermán to Herat, states "that in the whole tract there is but one green spot, where was built the town Khubbes, in order to facilitate the trade between the northern and southern provinces; but the place has gone to decay, and its inhabitants have become robbers, subsisting on the plunder of those whom it was intended they should protect." This is also a very incorrect account: there are many green spots on the road between Kermán and Herat, leading by Khubbes. As to the inhabitants of Khubbes being plunderers, this is altogether a mistake, and there is no more reason for their being so than for the population of any other place in Persia. They have often, however, been themselves plundered by the Belúch, and, as I have said, Ibrahim Khan built them their present fort as a place of security.

I have dwelt longer on the description of this place than it would, from its present insignificance, seem to deserve: it is, however, a spot never, I believe, previously visited by an European. It figures in some of our maps in a very wrong position, and being situated on the edge of the great desert, is of some consequence as a place of halt for caravans travelling between Khorassan and the south.

I took my departure again on the 10th of January. I had in the morning received a visit from a well-dressed Dervish, named Mirza Ahmed Khan, who came civilly to greet me. In the course of conversation he remarked that those of his profession make no distinction between man and man, regarding all believers in God, as of one family, and calling no man unclean. He spoke with contempt of the Mahomedan clergy, who preach that those of another faith *are* unclean. Afterwards he sent me a present of fruit, and waiting for me at his door, presented me as I passed with a nosegay and an orange, with the usual Dervish exclamation

tion of Ya Hak! (O God!). This man is, I believe, very well off, but has assumed the character of Dervish to insure him from extortion and oppression.

Thermometer at 8 A.M. 48° . I estimate the height of the plain of Khubbes above the level of the sea at 2500 feet.

We travelled in a direction E.S.E.* over an arid, stony, and perfectly sterile plain, in which not even a desert plant is found; the path inclining gradually to the S., the direction at the 2nd mile became S.E. by S., and we passed the ruins of a mud fort and scattered walls, occupying the former position of Khubbes at a period which my guide gravely attributed to the days of Lot. Towards the 3rd mile occurred the deep course of a mountain torrent. At the 8th mile we ascended some low hills of a gravelly soil, through which a deep ravine lay to our right: $\frac{1}{2}$ of a mile brought us to the summit, from whence Khubbes bears N. 25° W., and the castle of Andujerd, situated on a lofty hill, S. 5° W. Towards the 9th mile we entered upon a level tract of soft ground, and passed at $10\frac{1}{2}$ miles a watch-tower on a hill. The path then wound in a general direction S. across a small plain, leading us towards the 12th mile to the village Gowdin, a ruinous-looking place of scattered houses sheltered amidst groves of palm, orange, and lemon trees. Passing through it we reached in a few minutes the walls of the castle of Andujerd, crowning a height. The place is now hardly inhabited, and we crossed another small tract of land in direction S.S.W., reaching the village of Andujerd, situated at some distance from its castle, at the end of the 14th mile. This place has likewise its groves of trees such as I have just mentioned, but its inhabitants appeared very poor; they were, I was told, flourishing enough in the time of Futteh Ali Shah, but the extortions of the late governor, Fezl Ali Khan, and his infamous family, have stripped the wretched inhabitants of nearly everything they possessed of moveable property. This village and Gowdin have between them 12,000 or 15,000 palm trees, and tobacco and henna are cultivated there.

* *Distances and bearings.*

	Miles.		Miles.
Quit Khubbes E.S.E. Ruins of ancient Khubbes	2	Proceed S. 5° W.	$\frac{1}{2}$
E.S.E. to deep course of torrent	$\frac{1}{2}$	S. 20° W., a road leading to Hanza, 1 fursack off, in direction S. by E.	1 $\frac{1}{2}$
S.E. by S.	$\frac{1}{2}$	Hill with watch tower; general direction S. to village Gowdin	1 $\frac{1}{2}$
E.S.E.	$\frac{1}{2}$	S.S.W.; Andujerd, situated at a distance from its castle	2 $\frac{1}{2}$
S.S.E. 5° S.	$\frac{1}{2}$		
S. by E.	1 $\frac{1}{2}$		
Low hills; ascend S. 5° E. ..	2 $\frac{1}{2}$		
Khubbes bearing N. 25° W.; Castle of Andujerd on hill S. 5° W.			14

From Andujerd* we travelled southwards across the plain, presently descending into the broad bed of a mountain stream, probably 300 yards wide, flowing from Sereh, but at that time consisting only of little streamlets, which are absorbed by the villages of this plain. We ascended it for nearly 2 miles and then proceeded S.W. by W., crossing some low hills, from the top of which, towards the 6th mile, Khubbes was visible, bearing N. 5° W., and the castle of Andujerd N.N.E. From the N.E., and extending to S.E. of the compass, one vast tract of loot or wilderness, a sandy waste, heaped into waves and having the appearance of a dark expanse of sea, was apparent. An isolated mountain, bearing N. by W., at a great distance off, was pointed out as belonging to the district of Ravere; a steep descent through a very wild and rocky country brought us at 7½ m. into a deep valley, called Rudkhiz, possessing a small stream, and abounding with wild trees, amongst which I breakfasted; thence the road led S. up the valley for ¼ of a mile, the trees disappeared, and we quitted the stream, which here flows from the S.E. At the 11th mile we entered a narrow pass through a range of snowy mountains, extending from N.W. to S.E., and proceeded by a winding path. This pass presents a variety of rock, amongst which limestone and coarse green porphyry are observed. At the 12th mile we proceeded S. by E. by a gradual ascent up a broad stony valley. At the 15th mile the village Hashtad Toon bore N. 15° W., situated under some rocks at about 2 miles distance. Advancing up the valley we got amongst snow, with which the ground was partially covered, the soil beneath soft and salt. Here my compass getting out of order I alighted at the 18th mile, at

* *Distances and bearings.*

	Miles.		Miles.
S. to broad bed of stream . . .	1½	S.S.W. to dry bed of torrent . .	2½
W.S.W., S.W. by S., and		Enter narrow pass through	
W.S.W., ascend it . . .	1½	snowy mountains running	
Quit it S.W. by W. towards hills	½	from N.W. to S.E., and	
S.W. by S.	1	ascend by path winding	
Low, gravelly hills—road lead-		between S.S.W. and W.N.W.	1½
ing between S.S.W. and		S. up valley	½
W.S.W.	1½	S.S.E.	½
Khubbes bearing N. 5° W.;		Here a valley branches off to	
Andujerd N.N.E.		N.W.—then S. by E. by	
Descend	½	gradual ascent up broad val-	
Ascend through hills	½	ley.	
Steep descent—wild country . .	½	Hashtad Toon bore N. 15° W.	1½
S.S.W. by slight ascent . . .	½	Fendaker	5
W.S.W.	½	S.E. and S.S.E.	2½
Another steep descent into val-		Reach head of valley . . .	1
ley of Rudkhiz	½	Descend—reach Gowk . . .	5½
Quit stream flowing from S.E.	½		26½

the village Fendaker, where I quickly repaired it. The people appeared wretchedly poor, but they have some fields and trees about their village. Some sorrowfully clad children attracting my attention, I gave them each a small coin, upon which it was curious to behold how the party immediately augmented into a legion of half-clad little brats, produced without reserve from every corner by the old crones of the place. Here I observed a flock of *choughs*. The snow increased in depth as we proceeded S.S.E. up the valley, the head of which we attained at the 21st mile, and then descended rapidly in the same direction into a vale, in the centre of which lies the large village of Gowk, where we alighted, after a ride of about 27 miles. Our baggage was more than 11 hours on the way from the state of the roads, and some of my people who accompanied it, arriving after nightfall, were nearly frozen, and scarcely able to speak.

The valley in which Gowk is situated is about 2½ miles in breadth and several miles in length, N.W. and S.E.; the village contains some 1500 families, and covers with its gardens and houses a space of about 3 miles in length. It possesses two mud forts, situated towards either extremity, but the people, having sometimes been rebellious, are not now permitted to occupy them, and they are falling to ruin: one of them has a ditch into which water may be conveyed.

Gowk is attached to the government of Khubbes, but is regarded as a separate district, though containing only one village, Gowk itself. The place possesses little field cultivation, but its gardens produce a great quantity of grapes, some of which are dried and exported to many parts of the country, and are even sent to India. At this village there is a deep pool, about 15 yards wide, which this simple people denominate a *deriah* or sea, and assert that it is fathomless. One of my servants gravely inquired whether it contained any sharks (*naheng*).

On the 13th January we resumed our journey, having been obliged to give our cattle a day's rest. Direction* down the

* Distances and bearings.

	Miles.		Miles.
End of valley	2½	E.S.E.	1
S.S.E. Deh Melick	1	S.S.W.	1
S.E. by S., by slight ascent ..	1½	E.S.E. and S.S.E.	1
Along dry bed of mountain stream called Rūd Khaneh		S.E.	1½
Nask	½	S.S.E.	1
S.S.E.	1	Quit bed of river—S. by E. ..	½
E.S.E.	1	S. 5° W.	1
S. by E.	1	S. by E. and S. by W.	2
E. by S.	1	S. 15° E.	2½
S.W.	1	S.S.E.	1
		S. 10° E. and S. 5° W.	½

valley, S.E. by E., reaching its extremity at the end of about 24 miles; then $\frac{1}{2}$ of a mile in direction S.S.E., past Deh Mellek, a hamlet S.E. by S., by a gentle ascent leading presently among low hills, and then, at 44 m., by the dry bed of a mountain-stream, called Rûd Khaneh Nask, from a village of that name about 7 fursacks distant. The bearings of our route subsequently varied continually for several miles, and are noted in the margin; towards the end of the 10th mile we quitted the bed of the mountain stream leading from hills to the S., and proceeded as before by a broad valley, which is a continuation of that of Gowk, only that it is in one part broken into low hills, as I have already described. In the course of the march we encountered two caravans of camels from Ghayn, bound for Bunder Abbassi with wool, pistachio-nuts, manna, &c. They were reposing after the night's journey, according to the usual custom of camel drivers and muleteers, who seem to prefer the night to the day for exertion. They affirm that their cattle bear the fatigue better during the cool of the night, and arriving at their station in broad day, they are able the easier to make their arrangements for food, &c. Another reason is that the camels, on reaching their ground, are turned loose to graze, and would, of course, be more exposed to the attempts of thieves by night than by day. From the broad valley, we entered, at the 24th mile, a narrower one leading through low hills, and reached the top of the ascent at about 27 $\frac{1}{2}$ m.; then, traversing other valleys and hills, descended at the 31st mile into a great and very uneven plain. Here we passed a few wretched hovels, where we inquired our way to Tehrud, and reached this most ruinous little fort in the obscurity of the evening. The weather had been variable during the day, occasionally pleasant enough, at other times we had sleet and hail and cold winds. When we arrived at our station it came on to snow very heavily, and there being no chance of our baggage arriving for some time, I became very uneasy for those who accompanied it. Night set in, the people of

	Miles		Miles
S. 5° E.	24	Descend hills S.	4
S.	4	S. by E.	4
S.S.E.	11	S. by W.	11
S. by E.	11	S.	4
Aliighted at 2 caves	4	S.S.E.	1
S. 15° E. and S. by E. . . .	4	S.	1
S.S.W. across valley	2	S. 5° E.	4
S.W. by S., and S. 15° W. .	1	S. by E.	4
S.S.W.	4	Hovels	11
Entered narrow valley . . .	11	W. Hovels	11
Top of ascent	2	Tehrud	1
then S.			
S. by E.	11		38½

the village were timid and apprehensive of our intentions, lest we should impose ourselves upon them without remuneration, and we had difficulty in getting any of them to approach us. The fort, which is situated on a mound, high above the broad bed of a stream, at this season of trifling size, and flowing S.E., was a mere ruin of mud walls, wholly deserted, the few inhabitants of the place residing in wretched hovels at its base. I despatched some of the villagers in the direction of my expected party, and then set my people to make a bonfire on the highest point of the fort, whilst I kept up a discharge of fire-arms to attract attention. The fire, we afterwards learned, was seen by our people, but, being so high above the plain, was supposed by them to be in the hills, and was therefore disregarded. One of the villagers I had despatched fell in with the party, but in the darkness and snow missed his way, and was leading them off in a wrong direction, when a second man, attracted by the mule-bells, overtook them, and, guided by my firing, brought the party safely to the fort a couple of hours after nightfall, after a fatiguing march of about 38 miles. In all this distance no water is procurable, excepting in the plain of Tehrud; this latter possesses a good deal of cultivated land, on which the miserable peasantry work as labourers for the inhabitants of Rayen, a village of some 400 families, 9 fursacks distant, which, with Tehrud, forms one *buluk*. Rayen is the only place in the district deserving the name even of a village; Tehrud itself possessing only 7 or 8 families, inhabiting the meanest hovels that can be conceived. The productions of the plain consist of grain, millet, and palma Christi; of the former the quantity is considerable.

14th January.—Brilliant weather after yesterday's snow, which covers the country. Thermometer at 8 A.M. 29°. I was gratified in finding that the poor inhabitants, instead of taking to their heels, as they had done last night on our approach, this morning collected about the place to see us off. I passed the night within the fort, amongst its ruins, in one of the most miserable holes I was ever in. Here we were joined by some servants of Tahmasp Mirza, who were very attentive, and presented me with a brace of the partridge called Jirufti; and one of my people having fallen ill, I took the opportunity of sending him back to Kermán with the Prince's servants. We crossed the stream and proceeded easterly.*

* Distances and bearings.

	Miles.		Miles.
Cross stream, E. E. 20° S.		E. by S.	$\frac{1}{2}$
Recrossed stream	1 $\frac{1}{2}$	S.E.	1 $\frac{1}{2}$
S.E. and E. by S. along valley	$\frac{1}{2}$	S.S.W.	1 $\frac{1}{2}$
Again cross stream	1	Averk	$\frac{1}{2}$
E.S.E.	$\frac{1}{2}$		
S.E. by E.	$\frac{1}{2}$		8

A flight of birds attracted my attention; I imagine them to be a species of bustard or grouse—black beneath and with much white about the wings;—they were beyond our reach; the people called them Chukore. We passed through several acres of low jungle, and presently crossed the Tehrud stream, and entered amongst low hills. At the 2nd mile proceeded along a wide valley, where I observed a wolf, an animal that greatly abounds in this part. Magpies are also numerous. At the 3rd mile we again crossed the Tehrud stream, which then flowed to our right, through hills, in its course to Averk and Bumm. We reached the former at the end of 8 miles; it is sometimes called Abarek, and is a small village of about 25 miserable hovels, situated near a mound crowned by the mud walls of a fort. It stands on the skirts of a vast plain stretching from S.W. to N.E. From this point is seen a high range extending westward from S. 30° E., 19 fursacks, or 57 miles distant. Kûh Hazar, W. by N. 42 miles off, or about 6 miles W. of Rayen. There are hot springs less than 2 miles from Averk in a direction N.E. by N., inclosed within a building; the water is clear and nearly tasteless, but leaves a lime deposit. The temperature 96° in the reservoir.

I was obliged to make a halt at Averk, there being no inhabited spot on our way, it was affirmed, nearer than 30 miles.

We had clear frosty weather on the following morning and made an early start, proceeding along the bed of the Tehrud stream, which I believe is called Rûd Khaneh Pool. This stream has a broad bed occasioned by heavy torrents which sweep down from the mountains on the S. Antelopes and sand grouse are very numerous on this plain, which possesses a thin sprinkling of bushes. At the 14th mile we alighted at some ruined hovels called Darzin, and entered the district of Bumm.* The plain as seen from thence

* Distances and bearings.

	Miles.		Miles.
E.S.E. along river bed	2½	Reached Behderan	½
S.E. 5° E.	½	¼ of a mile S. is Khadjeh-Asker, a hamlet.	
S.E.	½	½ mile E. the hamlet Der e Bagh.	
S.E. by E.	2½	½ mile S.E. by E. that of Harasan.	
S.E. 5° E.	3	Fort of Bumm bears E. 10° S.	
S.E.	2½	Thence E.	2
Buined huts called Darzin . . .	½	E. 20° S. across stream and	
Averk bears N.W. by W. from this.		E.S.E.	½
E.S.E., E. by S., S.E. by E., and E.S.E.	1	E.	½
E. 20° S.	1	E. by S., and along bed of river	½
E. by S.	½	Del Oshtur, on river	1½
E. and E.S.E.	½	E. by S. to Bumm	2½
E.	½		
Along broad bed of river E. 5° S.	1½		
E. by S.	1		
Quitted bed of river	½		

28½

presents a wide expanse from S. 30° E. (the point of a high range running E. and W.) to E. by S., another point or termination of a low range running about N.W. and S.E. from near Averk. There is a good deal of cultivation near Darzin belonging to Behderan, and the peasants were scattering seed over the land preparatory to ploughing. Afterwards we passed some reed huts of a small tribe called Aveel, and at the 22nd mile we came to Behderan, a village situated on the left bank of the stream, and having several hamlets about it. The people complained that for three years past their crops had been destroyed by the insect *Sinn*. At the 28th mile we reached Deh Oshtur, a village on the right bank of the stream; and at the 30th mile alighted at Bum.

This is a small fort and town, the former encircling and crowning a high mound and rock; the habitations are principally situated at the foot of this height. I had not originally intended visiting this place, and had therefore come unfurnished with letters from the governor of Kerimán. The officer commanding the little garrison, on my application for leave to enter the fort, declared that he dared not, without orders from his superior, who was absent, admit any foreigner within the walls. This was the first place to which I had ever been refused ingress in Persia. I did not urge the point, seeing the jealousy that was shown, and contented myself with a walk round the fort, which is situated on the right bank of the stream, and is nearly square, its southern face being about 600, and the eastern 500 paces in length. This little fortress has been constructed with much care, and is probably one of the strongest places of the kind in Persia. It consists of an outer line of wall and ditch, the former of which is in a crumbling condition. Within this rises a high rock, on which the citadel is built. The latter has a gate leading into it from the town on its southern side, and a small one on its northern face opening into the plain. A trifling garrison occupies the place, in charge of about four light iron guns, which are probably of European make. One only I believe is mounted. Three brass guns and a mortar, or howitzer, belonging to the place, had been despatched with the expedition then in Jerust. The military force of the whole district is stated to consist of 300 *serbáz* (regulars), and 500 matchlockmen. The interior of the town is little better than a ruin: only about 30 families, and half as many shops, are found in it; but even in this insignificant and out-of-the-way place I observed the produce of English looms exposed for sale. The population, which I was assured does not exceed 400 families, resides almost entirely outside the walls, their habitations scattered amongst gardens and groves of palm, pomegranate, and other trees, which cover a considerable space.

This town is said to be of ancient origin, and is ascribed to

Ardeshir Babeghan: it is reputed to have been as large as Kermán in former times, and ruins of some little extent are found on the N. and W. sides of it.

In the early part of Mahomed Shah's reign, troops were sent here against Agha Khan Muhulatti, who was in rebellion, and the fortifications were partly destroyed by order of Feruz Mirza, then governor of Kermán. On the death of the above sovereign in 1848, some 400 Belúch and Afghans invaded the place, and what is called a fight took place; the casualties, however, seem to have amounted to only two men wounded on either side.

To put against this, I will mention that the acting governor, Agha Mahomed Reffera, told me that he was with the expedition against Bunnár some nine years before, when that place was taken by Habbíb Ulláh Khan: the fort surrendered after a few shells had been thrown into it, and its inhabitants were promised fair treatment. About 30 families of Belúch, however, not choosing to put faith in Persian promises, departed with the intention of seeking safety in flight. They were pursued by the Persians in a much stronger party; upon which, finding that they could not escape, they drew up on a mound, slaughtered all their women and children that they might not fall into the hands of the enemy, and sword in hand rushed upon the Persians, and were slain to a man. The people here described the Belúch as eminently brave, preferring to fight to the last rather than yield or fly.

Not having access to the citadel, the only elevated spot in the vicinity, I could not obtain bearings. The district possesses about 15 villages, many of which have date-trees, but these latter do not thrive so well as at Khubbes, where the climate is warmer. Besides grain, rice, and cotton, there is little else produced in the district. Its revenue amounts to about 1800 tomans (900*l.*). It is not nearly so fine a tract as the adjoining district of Nermashir; it extends E. and W. 10 fursacks, and from the mountains of Jemal Bariz on the S., to Ku-Sang Buré Kebuti on the N., 6 fursacks. Both these districts are in a ruined and impoverished state, owing partly to bad government and oppression, and to the frequent disorders to which they have been exposed from the invasion of Afghans and Belúch.

The oxen in this part of the country are of a small, humped species, and are commonly used as beasts of burthen; people also ride on them, seated on a soft pad, and a rope is passed through the nostril, by which they are guided. Water boils at Bumm at 2034°.

I quitted the place on the 17th January, and passing through the neighbouring village of Bagh e Khan, was soon traversing

a stony plain in a direction W. by S.* At the 2nd mile the hamlet of Bagh Nú occurred; then, in a direction W. by N., we crossed, at $4\frac{1}{2}$ m., the Tehrud stream, at a bend it makes from the southwards, and passed the hamlet Hararun. At the 12th mile we alighted at Fedva, a spot at which we had been told we should find a caravanserai. Two ruinous hovels, however, were the only structures, and in these we deposited ourselves for the night, having brought with us provisions and provender for this and the next deserted stage.

We got through the night well enough, though in a great measure exposed to the open air, which however in these soft climates is no hardship. We continued our way over this stony plain in direction S.W. towards the mountains, and subsequently on the bearings noted in the margin.† A sprinkling of bushes of the wild almond and thorn, and of a tree called *bermeh*, occurred as we advanced, the former giving shelter to numerous coveys of partridge. At the 14th mile we ascended low hills at the foot of the mountains, and at the 15th mile entered a valley; at the 16th mile we descended N.W. by W. amongst hills clothed with scattered trees and bushes as before described. At the 17th mile we turned up a valley leading S.W. by S., and alighted to breakfast, and to allow of the baggage coming up with one of my servants, who, having fallen alarmingly ill, was carried stretched on the back of one of the mules. Continuing southwards the valley expanded, and we passed the ruined village of Deh Bekri, belonging to the district of Sardu, 12 fursacks distant to the W.; there were no

* *Distances and bearings.*

	Miles.		Miles.
W. to Bagh e Khan	14	W. by S.	1
W. by S. Bagh Nú	$\frac{1}{2}$	W.S.W.	$\frac{1}{2}$
Tehrud stream	24	W. by S.	$\frac{1}{2}$
S.W., W.S.W.	13	W. by N.	$\frac{1}{2}$
S.W. by W. and S.W. ..	$\frac{1}{2}$	W. to Fedva	$\frac{1}{2}$
W. 25 S., W.S.W., and W. by S.	2		
W.S.W.	$\frac{1}{2}$		12 $\frac{1}{2}$

† *Distances and bearings.*

	Miles.		Miles.
S.W.	4	S.	$\frac{1}{2}$
W. 5° N. by gentle ascent ..	1	S.W.	$\frac{1}{2}$
W. by S.	14	Valley expanding; Deh	
W.	34	Bekri; then S. by W., and	
W. by S.	1	presently S. through snow;	
W. 5° S.	13	ascend hills 4 min.	44
W.S.W., ascend low hills ..	2	Descend S.S.W.	$\frac{1}{2}$
Enter valley, W.	1	S. by E. and S. by W. by hill	
Descend N.W. by W. among		side	1
hills	$\frac{1}{2}$	Alighted at caravanserai.	
Up valley S.W. by S.	1		244

inhabitants, but the fields around were under cultivation. Presently afterwards we got amongst snow, which deepened as we ascended through hills still clothed, though not densely, with trees and shrubs. The 22nd mile led us to the extremity of the valley, and presently afterwards to the top of the ascent. The path then lay down the mountain-side through a wooded country to a small ruined and uninhabited caravanserai, which was to afford us shelter for the night. It was open to the air on one side; but though the country lay deep in snow, and we were at a considerable elevation, the climate was comparatively mild: the distance travelled this day was about 24 miles. The caravanserai in which we had found shelter is situated in the district of Meskin, belonging to Jemal Bâriz. Mountains rising range beyond range, many of great height, were visible to the W. and S.W. When our baggage arrived we could hardly find space for the whole party to be accommodated in the ruin, for, besides my own, which consisted of 15 men and 19 beasts of burthen, several other travellers and their cattle had to be crammed into the building. The night proved very cold, and, what with the constant jingling of the mule bells and the restlessness of the cattle amongst which we had to lie down, very little sleep was possible.

We were off early on the following morning (19th Jan.), descending the mountains by a very winding path in a general direction S.W. for the first 2 miles;* the country abounding with partridge in greater number than I had ever seen them, and, from the quantity of covert, affording excellent sport. Getting out of the snow as we descended, we proceeded by a pleasant path winding by slight risings and falls through a charming country of wooded hill and dale. Sometimes the wild almond was the only tree or bush visible; though destitute of leaves at that season, its lesser branches are green at all times, whilst its stem is of the darkest brown. We continued the descent until the 10th mile, when we alighted at a pleasant spot to break our fast; and at the

* Distances and bearings.

	Miles.		Miles.
S.W. general direction	1½	S.	1
Windings	1	Descent—S.W., W., W. by N. and W.S.W.	5
S.	1	S.W.	1½
S.S.E. and S.	1	Quit mountains S.W.	1½
S.E. and S.	1½	S.S.W. to Rud Khaneh Shor ..	1
S.E. to S.W., windings	1½	S.W. 5° S.	1½
S.W. by W.	1	S.S.W.	1
S.W. by S., S., and S.W. ..	1½	S. by W. to S.	5
S.W. by W.	1	S.E. to Huts (Serjaz)	2½
Windings—general direction			
S.W. to river Rud Khaneh			
Saghdar	1½		30¼
Ditto	1½		

11th mile crossed the Rud Khaneh Saghder, a small river flowing to the N.W. Subsequently the path led over low hills until the 12th mile, when we commenced a great descent, through a picturesque country of mountains, towards the plain of Jeruft by a difficult, rough, and rocky road. This fine pass is known as the Gúdar Múgat; the hills were scantily clothed with shrubs and the tree *hoonar*; the latter seems to retain its leaves, which are nearly circular, throughout the year. It bears a round stoned fruit, and its branches are armed with crooked thorns. We quitted the mountain-pass at 17½ m., and entered the plain of Jeruft, traversing a most stony tract, southwards, by a descent towards the Rud Khaneh Shur (Salt River), a very rapid stream, varying at that time from 20 to 30 paces in breadth, but flowing through a much wider, deep, and rough bed in a direction from N.W. to S.E. Its waters, notwithstanding its designation, are perfectly fresh, and its sand contains the same sparkling substance I have observed around Yezd. I am told it has its source in Dildard, in the Sardu district, 8 fursacks (or 24 miles) off. The neighbouring stream, Hali-rúd, which unites with it lower down, and which I shall have occasion to mention elsewhere, is said to have two sources, one in Rahburé, the other at Hanza of Sardu, 4 stages distant. The Rud Khaneh Shur and Hali-rúd join 3 miles S. of Serjaz, and, flowing through Rudbar, pass on to Jaz Morian, a plain, 8 stages distant, between Rudbar and Bumpur, where the water spreading over the country is lost in the sand.

Thence we continued for about 7 miles over the same kind of stony waste as before. Night overtook us, and no habitations were visible on the plain; but, falling in with some Eliatz, we procured a guide, who conducted us to some reed huts, at one of which, a clean and spacious dwelling, we alighted, at 29½ m., and found comfortable and abundant accommodation.

This place is called Serjaz—a mere collection of reed huts, occupied by the tribes from Isfundekkeh during winter. A small fort stands near, uninhabited, and serving only as a place of refuge in time of danger. I found the boiling-point of water on this plain (Jeruft) to be 209°.

Jeruft is a warm tract of plain country, lying between parallel ranges N. and S., many parts clothed with low jungle. As it possesses a mild climate and abundant pasturage, it is resorted to in winter by many small tribes who occupy the mountain districts at other seasons. It possesses only four or five collections of huts which can be termed villages, each possessing a small mud-fort as a place of refuge, but seldom inhabited; these are Serjaz, Du Saré, Kaleh Nu, and Kaleh Poesh: the rest of its unsettled population resides in little groups scattered over the plain.

The heats are so great in summer, and the flies so numerous,

that it is almost wholly deserted by the tribes, who return to the mountains of Jemal Bariz, &c. The lands yield grain, millet, pulse, beans, rice, cotton, henna, palma Christi, and dates; and in some parts are of great fertility—from five to thirty fold are spoken of as the return for barley and wheat. In the middle of January, green crops of barley, high enough to be cut for the food of cattle, were standing in the fields. Therm. at 10 A.M. on 22nd of Jan., 81° in my tent, and at noon 86° . Sheep, goats, and horned cattle, and their produce butter and wool, are advantageously purchased here. The flocks yield lambs twice a year.

The regular revenue is stated to be about 2900 tomans (1450*l.*), but is nearly doubled by local impositions.

The jungle and reeds with which this plain is clothed in parts abound with game, such as the francolin, the partridge known as jirufi (*Perdix Pondicereanus*), and the wild hog.

The plain is watered, as I have already stated, by two streams, both considerable during the floods. On the banks of one of them, the Hali-rúd, on the N.W. side of the plain, are the vestiges of the city known there as the "Shehr e Daghiannus," the position of which I at first thought might in some respects answer to the description given of that of Camandu by Marco Polo, but I have since had reason to alter this opinion.*

This site I proceeded to visit on the 20th January, sending on my baggage to Du Sarí, in the opposite direction. It lies at about 3 miles W. 20° N. of the fort of Serjaz. The spot is an elevated part of the plain on the right bank of the Hali-rúd, and is thickly strewn with kiln-baked brick and shreds of pottery and glass. Many spaces are remarked destitute of such remnants, and no doubt mark the position of court-yards and gardens. After heavy rain the peasantry search amongst the ruins for rude ornaments of stone, and rings and coins of gold, silver, and copper. The popular tradition concerning the city is, that it was destroyed by a flood, long before the birth of Mahomed. Daghiannus was king of the country, and set up for a god, ordering his subjects to pay him divine honours. Seven of them refusing to do so, retired to a cave, and the story of the Seven Sleepers is related of them.

I was able to procure only one of the coins occasionally picked up there; it was Arsacian (Parthian), but ill preserved, and the inscription illegible.

* I have since had reason to think that I was mistaken in considering the ruins of the Shehr e Daghiannus, in Jernft, as representing those of the ancient town of Camandu, mentioned by Marco Polo, although several circumstances seemed at the time to recommend them as such. Some information, which I obtained subsequently, renders it probable that the site of Camandu may be found at the bottom of the descent leading into Kushkuh, or Kushghan, 15 farsacks, or 45 miles, S. of Ahmedi, on the direct road from Kermán to Bander Abasi, where ruins of a town are said to exist. The distance from Kermán, and the description of the country, agree with Marco Polo's narrative.—K. E. A.

We crossed the Hali-rúd at about $1\frac{1}{2}$ mile from Serjaz. The stream was about 25 paces across, less deep and rapid than its sister stream of yesterday, but flowing through a still wider bed; N.W. to S.E. at that part. From the site of Daghiannus I took the following bearings:—

Iafundekeh—district lying W. by N. about 12 fursacks = 36 miles distant behind the mountains.

Oorzu—district lying behind mountains 30 fs. = 90 miles off S.W.

Sardu—N.W. to N.—district of plain and mountain, 15 fs. = 45 miles off.

Jemal Bariz—mountainous district bounding the plain of Jeraft, and extending from N.N.E. to S.E. of Daghiannus.

Rudbar—district S.

The above distances include the windings of the roads over mountains, and would probably be very considerably less in direct line.

Returning from Shehr Daghiannus we passed at about 2 miles W. of the fort of Serjaz, and proceeded through a tract of high and low jungle, with which the plain is clothed at this part, the land in general appearing very salt. Shortly afterwards we passed the Rud Khaueh Shur, flowing in a diminished stream, from much of its water having been taken off for irrigation, below the spot at which we crossed yesterday. Our guide deserting us by hiding in the wood, we found our way with difficulty through the jungle, and much time was lost in consequence, until we procured another and more faithful leader. I took few bearings, but our route led us in general nearly S. and S. by E. from Serjaz; and we did not reach Du Sarí until long after nightfall. The distance is called 6 or 7 fursacks. I estimate it at 20 miles. I became the guest of a merchant named Hadji Mahomed Ibrahim, whom I had seen at Kermán, and whose hospitality in such a place was very acceptable.

Du Sarí, like Serjaz, is a collection of wretched hovels and reed huts, lying near a mud fort. The latter was tenanted solely by the family of the chief of Jemal Bariz. Gholam Hussein Khan, who occupied a large tent in the area of the building. Everything about them and their tribe indicated poverty.

I was detained here by the continued illness of one of my servants. Having nothing better to do, I devoted some of the time to shooting; and in my walks visited a spot close by, under the mountains, possessing extensive groves of date-trees, and a fine limpid spring of warm water of the temperature of 81° , issuing from under some rocks of curious formation. It is $1\frac{1}{2}$ mile N.E. of Du Sarí. I found a party of dervishes bathing in it: they had assembled there, some from their travels in India, others from Russia, Khorassan, Baghdad, &c. I have usually found these people very civil, and not so encumbered with religious prejudices and fanaticism, as their more orthodox brethren.

The independent, wandering life they lead, and their visits to distant lands and people, render them familiar with a thousand scenes and diversities of races and creeds, which the ignorant, untravelled Persians despise in their limited knowledge of the world and bigoted pride in a vain belief. Though generally a low, profligate race, the dervishes pretend to worship God in their hearts by constant meditation on his attributes. They associate little with men of other professions, but are more tolerant in their opinions than any of the Mahomedan sects. They are probably freethinkers in every sense, and seldom burthened with either a knowledge or concern about religious forms and controversies. They explore most countries of the Eastern continent, and acquire an ardent taste for a wandering existence. I asked the party I have mentioned how they could endure to lead such unsettled lives. They replied, that as long as life lasts the Almighty takes care of his creatures everywhere, and that a wandering life is preferable to any other. These assertions they supported by reciting verses from their poets, and interlarding their conversation with religious apophthegms and jargon. In their long peregrinations they select the countries and climes most agreeable, according to the season, and subsist on the charity and credulity of those amongst whom they pass their time. They are supposed to possess a knowledge of many wonderful cures for the evils which afflict the human race, and deal out to the credulous and despairing charms and recipes which afford to the donors a pretty certain means of livelihood.

January 23.—Our route from Du Sarî was at first S.W.,*

* *Distances and bearings.*

	Miles.		Miles.
S.W.	1½	170°	½
245°	1	215	½
200	½	195 and S.W. to united stream	
220	½	of Hali-rûd and Rud Kha-	
190	½	neh Shar	1
200	½	190° to 170°	½
185	1½	160 165°	1
190	1	160	1
215	½	180	½
210	½	160	½
200	½	190	1
205	½	205	½
210	1½	190	½
185	1½	175	½
205 and 215°	½	S.E. and 195°	1½
190	½	180°	½
175 190°	1	165 to Deh Pâh	½
210	½		
205	½		
170 175°	½		

23

by a continuation of the plain, the soil of which is sandy and gravelly, but productive under the effects of a fine climate. In parts it is very salt. The heat was great, and my dogs even were panting and seeking the shade of bushes, of which there was a sprinkling, and occasionally patches of close jungle. At 14½ m. we reached the joint stream of the Hali-rud and Rud Khaneh Shur, flowing to the S.E.; it is about 60 paces in width, and here we entered the district of Rudbar: 8½ miles farther brought us to the Persian camp at Deh Pîsh, then on an expedition against Banpur, and consisting of parts of two regiments (about 1500 men), four guns, and several hundred matchlockmen, the whole under the command of Abdullah Khan, who had lately been honoured by his sovereign with the title of Essam u'Dowleh (Sword of the State). I was wholly unknown to him, but he received me with the utmost courtesy and kindness; and having appointed me quarters, immediately came to welcome me to his camp. I was constrained, by the still suffering condition of one of my party, to remain a day with my host, which was passed agreeably in a hawking excursion, in which we were very successful amongst the Francolin and Jeruft partridge.

The plain of Rudbar, which is a continuation of that of Jeruft, and continuous with that of Banpur, is an extensive tract, but very thinly peopled, containing only six villages; the rest of the population is scattered over it in little camps of black tents (*pelass*), or in huts called *kûtúk*. The names of the villages are—

Kehnu, the chief place	} Each possessing a small fort.
Manujan	.. .. .
Gulashgherd	.. .. .
Deh Kehnu	.. .. .
Nu Diz	.. .. .
Kundere	

At about 2 miles from Deh Pîsh (the spot on which I found the camp, though I saw no fixed habitations there) are to be seen the ruins of a small town or fort called Kerg, the remains of which are of stone and brick.

Rains fall in these plains from January to March, after which a luxuriant growth of grass springs up.

January 25.—I took leave of my hospitable friend and proceeded towards Kehnu.* At the 12th mile we passed near the ruined fort

* Distances and bearings.

	Miles.		Miles.
205° 290°	1½	230°	1½
230	½	215	½
215 225°	4½	195 to Kehnu	1½
220	½		13
245	2½		

of this name, attached to which are extensive groves of palms stretching to the westward : here a few huts were seen, but the new fort to which we were going, lies a little S. of this spot, and we reached it at the 13th mile. It is situated on a small hill, rising about 200 feet above the plain, at the commencement of a broad valley, extending E. and W. The defences consist of a double line of wall built partly of stone and partly of earth, which have been a good deal impaired by earthquakes, said to be of frequent occurrence there, and about 250 to 300 huts are scattered along the base of the mound ; these habitations are formed of the branches of the palm-tree, stripped of their leaves, and fastened together in bundles for the uprights ; strong reeds are bound horizontally to these, and a close matting covers the whole. I was accommodated in one of them, which possessed a low doorway and two small holes in the roof, the only apertures for light ; they are very warm habitations, and when a fire is lighted they become almost insupportably so to a stranger, though the natives seem to enjoy a high temperature and to shrink from the slightest degree of cold. The people here, as at Du Sarí, are principally *gholams* (slaves), or *khané zad* (those born of slaves or other domestics), of the chief of the place ; they are a mixed race of blacks, and the descendants of a population originally from Beluchistan. There are a few small free tribes around the place, one of which, called Khitur, has the same reputation as the Suzmanus of Kermanshah, that of prostituting their females, even the married ones, and openly trafficking in this way. The population of the district may be from 2000 to 3000 families, and can on occasion muster about 1000 or 1200 good matchlockmen. The revenue is about 3000 toman (1350*l.*), raised as a poll-tax, each family being rated at 1 toman (9*s.*), and adult males, unmarried, at 5 *kerans* ($\frac{1}{4}$ toman) each.

Barley, wheat, rice, indigo leaves, cotton, and dates are the productions of the district.

I had been asked to prescribe for Rustum Khan, son of the chief of the country, whom I found half dead with fever at the Persian camp, and my remedies were so far successful that his people were enabled to transport him on a litter to his house ; on my arrival there I again visited him, and the people seemed anxious by their attentions to show that they were thankful for what I had endeavoured to do for him. I subsequently heard of his recovery.

The following bearings were taken from the fort :—

District of Rudan, S.W.—the part visible consisting of a range of mountains 15 miles distant, running E. and W.

District of Beshakird—in our maps written Bashkurd—S., commencing at some hills 3 miles distant, is a mountainous tract extending towards the

sea; the distance to Bunder Abasi being 37 fursacks, or about 111 miles from Kehnu.

S.E. to about E.N.E. is a wide expanse of plain.

Mountains of Kelmud, lying 6 miles off, between W. and N.W., and belonging to Kehnu, are not inhabited.

Kaleh Kuhineh—the old fort of Kehnu—N. 15 E., nearly a mile distant.

We quitted Kehnu* on the 26th January by a path which presently led us through jungle, and brought us gradually near to sterile mountains forming the northern boundary of this vale, which is probably 6 or 7 miles in width, flat, and more or less covered with trees and bushes, between which grows a fine carpet of turf; the trees are mostly of a species of acacia, called kehaur. At the 11th mile we alighted at some wretched huts, the people of which supplied us with sour milk and fresh butter; they appeared to be in extreme poverty, and not a thread of carpeting was to be seen on their floors on which to sit—only matting. The men have frequently long curly hair, which they wear in a large bunch behind each ear, in this respect much reminding one of the figures sculptured at Naksh-i-Kustum and Shahpur. Their heads are usually only further protected by a shallow skull-cap; the rest of the male attire consists of a loose pair of drawers and a shirt, both usually of coarse blue calico—the sandal is commonly worn. This valley is ill supplied with water, and the people subsist with difficulty by what they obtain from wells 12 or 15 yards deep; and what I tasted was bad and almost putrid in flavour. At the 18th mile we reached the northern extremity of low hills, interrupting the valley, in a direction N.W. and S.E., and passing through these, entered a broad plain, the mountains receding on the N. to a distance; the country to the S. occupied by low hills, and behind these, mountains, which, as we advanced,

* *Distances and bearings.*

	Miles.		Miles.
W. and W. by N.	1	225° 200°	$\frac{1}{2}$
270°	$\frac{1}{2}$	230	1
245	$\frac{1}{2}$	230	1
255 275° 270°	$\frac{3}{4}$	255° 260°	1
265	1	270	1 $\frac{1}{2}$
250	$\frac{1}{2}$	Northern extremity of low hills.	
265	$\frac{1}{2}$	260° 270°	2 $\frac{1}{2}$
225 250° 255°	$\frac{1}{2}$	240	2
265	$\frac{1}{2}$	225	1 $\frac{1}{2}$
250	1	233	$\frac{1}{2}$
260 280° 270° 265° 250°	1	225	$\frac{1}{2}$
255	$\frac{3}{4}$	215 225° 250°	$\frac{1}{2}$
270 265° 260°	$\frac{1}{2}$	230 220 210	1 $\frac{1}{2}$
270	$\frac{1}{2}$	180 through palm groves to Rud Khaneh Berr	
260 250°	1 $\frac{1}{2}$		27 $\frac{1}{2}$
S.S.W.	$\frac{1}{2}$		
W.	1 $\frac{1}{2}$		
255°	1		

receding farther S., increase the width of the plain. At the 26th mile, having reached a clump of tall palms, we ascended by the bed of a rivulet, passing other extensive plantations of the same tree; and finally alighted at a collection of 14 poor *kutúk* or huts, at a spot called Rud Khaneh Berr. The people and date-groves are the property of the chief of Rudbar. The distance travelled was about 28½ miles.

We observed on this march numerous flocks of sheep and goats, chiefly the former; the white fleece predominating over other colours in the sheep, which would give the wool a certain value in Europe. Rahburé lying to the N.N.E. and Isfundekeh to the N. are rich in flocks and in oxen, and what we saw here of the former belonged to those districts chiefly, being sent hither for winter pasturage.

From Rud Khaneh Berr, the mountain Shahmál, a peaked rock 18 or 20 miles distant, bears 240°. Mountains above Ahmedi, barn-shaped, lie at a distance of some 20 miles on a bearing of 280°. On the N.W. of the plain below are the mountains of Súghan and Dowletabad, two villages in that part; mountains of Kelmurd extend from N. to 70° E. The situation of the fort of Rud Khaneh Duzde was pointed out as bearing 250° from hence, 9 miles distant; it is in Rudan, a district then in the possession of Sheikh Seif, of Bunder Abasi, and lying immediately S. and W. of Rud Khaneh Berr: it belonged to the chief of Rudbar until some years since, and the Sheikh is accused of having gained possession of it by the murder of Mustafa Ali Khan.

On the 27th we were early in the saddle, and continued along the plain,* which, for a few miles, was uneven and broken into ravines, then occurred a tract of fine turf with a sprinkling of the kunar and kohur trees. Soon after quitting Rud Khaneh Berr

* Distances and bearings.

	Miles.		Miles.
N.W.	½	270°	½
270° 240° 235° 230°	½	285	1
220	½	To Chakunarik (bed of a	
230	1	stream flowing from the W.)	
235	½	285°	½
270 285°	1	300	½
270	½	290	½
260	½	275 290°	3
235 270°	½	315	½
260	½	285	2
230	½	305	1½
225 270°	½	300	½
S.S.W. to Rud Khaneh Duz-		310	1
de	1	300	½
S.	½		
290	½		22
295 300°	½	Then back eastward	2
295	½		
275	½		20

this morning, we entered the district of Rudan and breakfasted by a small stream, when the people from some neighbouring huts brought us various preparations from milk, and delicious dates covered with the sweet concretion which belongs to this fruit when fresh and recently potted.

Rudan possesses a small fort, but the people live generally in reed huts. The ruins of a town are spoken of as existing in this district, which is both smaller and less populous than Rudbar.

At 9 $\frac{1}{2}$ miles we reached the stream called Rud Khaneh Duzde, flowing S., very shallow, and only 15 yards in width. Date-groves extend along its course. The heat was very oppressive, and flies in swarms attacked our horses. In these parts a curious bush is found—a species of palm: its leaves grow at the extremity of the branches in the shape of a fan; it is called Pecsh or Daz, and the people say it was the creation of Satan in his attempt to imitate the real date-palm, invented, as is vulgarly supposed, by their Prophet: it proved, however, a failure. The fan is fibrous, and is used for matting, &c.

At the 23rd mile we alighted to wait the coming up of our baggage, and here falling in with a shepherd, he informed us that it would be impossible to reach Ahmedi that day, and recommended our putting up at some neighbouring tents, there being no other habitation short of the above-named place. The baggage was so far behind, and so little remained of the day, that I reluctantly consented to turn off a couple of miles in direction E. to the tents, which we found miserable in the extreme, and composed merely of matting. The Francolin and Jerufi partridge are found in these parts, also the teeher or diminutive partridge of Persia and pin-tailed grouse. My horses had been 5 days without straw; barley, however, was generally procurable.

28th January.—After leaving our quarters,* at the 5th mile we

* *Distances and bearings.*

	Miles.		Miles
285°	$\frac{1}{2}$	285° 290°	1
270 290°	1 $\frac{1}{2}$	Cross road to Bander Ahassi ..	$\frac{1}{2}$
300	$\frac{1}{2}$	W. to low hills	$\frac{1}{2}$
285 290° 300°	1 $\frac{1}{2}$	Through them W. to N.W. ..	$\frac{1}{2}$
To deep gully, winding S.W. by S. to N.W. by W.	2 $\frac{1}{2}$	260° 275°	1
N. 225° to 285°	1 $\frac{1}{2}$	290 to 270°	$\frac{1}{2}$
N. to S.W.	3	290 up pass	$\frac{1}{2}$
S. by W. to W., N. to S.S.W. ..	$\frac{1}{2}$	295	$\frac{1}{2}$
Summit of pass—descend in general direction—		W., S.W., and S.	$\frac{1}{2}$
160°	2	215° and 220°	$\frac{1}{2}$
240	$\frac{1}{2}$	260 and 240	$\frac{1}{2}$
255	1	W., S.W., W. by S.	1
230	$\frac{1}{2}$	270° 285°	1
270 to 300°	$\frac{1}{2}$	280 and 270°	2 $\frac{1}{2}$
265	$\frac{1}{2}$	To Ahmedi.	
			24 $\frac{1}{2}$

descended into a deep gully resembling the bed of a torrent, and followed its windings by a very rough and difficult path with a gentle ascent, after which it narrowed considerably with high abrupt sides and water lying in little pools in the bottom. Towards the end of the 13th mile, after a most difficult route amongst the rocks of this deep gully, we reached a point, which, leading up the side of the rock, brought us immediately out of the pass. We then proceeded through a rocky wild country, by a difficult steep descent, dangerous for laden cattle, until it terminated at about the 15th mile. We then proceeded by an infamous road about W.S.W., down a valley containing trees and low jungle, and at the 17th mile entered a small plain surrounded by rocks, and presently crossed at right angles the high road leading from Kermán towards Bunder Abassi. Passing through low hills and across a broad stony valley through which flows a rill of water southwards, at the 20th mile we ascended and then crossed another stony valley; presently afterwards, entering a narrow pass through craggy weather-worn rocks, we turned off to the W. through low rocky hills, and soon afterwards proceeded S.W. by S. Thence the road led into a valley partly occupied by extensive plantations of palms, across a rivulet and over an intensely salt tract of land into another valley of palm trees and jungle, in direction W. and S.W. This brought us into a more open country, and descending at the 23rd mile into one more valley of date trees, we proceeded up it in a direction varying between W. by S. and due W. to the fort of Ahmedi, which we reached towards the end of the 26th mile. Here the people appeared ill-disposed to receive us, and returned uncivil answers to our inquiries. The servant I had sent on before me had missed the place, and no one would show us to the habitation of the chief, by name Rais Gholam Rizab. We entered the outworks of the fort, and proceeded to the inner gate, but this we found closed against us. The people, however, said their Rais was coming out to me, and presently he made his appearance and informed me my lodging would be over the outer gate. He was barely civil, and in reply to my remark on the boorishness of his people, merely observed that, please God, they would learn manners.

Ahmedi is a small, square, mud-built fort, with three towers on each face, a deep but narrow ditch, a gateway, and drawbridge. I could not enter the interior fort, but was told it contained only a few families, and some 60 more are scattered around it under huts made of date trees and boughs. I observed here three old iron guns without carriages, of European make, two of them bearing their respective weights marked in European figures. The fort is situated near the southern side of a small plain, the soil of which is partly stony, and partly light and sandy, and poor enough. Water is very scarce, and is raised from deep wells by means of a rope, pulley, and leather bag, to the first of which an ox is attached; the

water being emptied into troughs, is conducted into the fields for irrigation. There is little field cultivation, but groves of palm trees are numerous.

On my arrival I was surprised to find many of the people completely armed with swords, guns, pistols, and other paraphernalia of war, as though about to start on service. Even the Rais in coming to see me had his sword on. I was told that what I saw was nothing extraordinary: the people never quit their arms day or night for fear of a surprise, and they are at present on bad terms with the Larees. Ahmedi, properly speaking, belongs to Lar, but had lately placed itself under the Sheikh of Bunder Abassi. It is said to extend 8 fursacks on all sides of the fort, and the whole population may be about 1,000 families. A great quantity of dates is produced in the district, also figs, oranges, and other fruits. I found there a reputed descendant of Nadir Shah, by name Mahomed Soffi Mirza, a son of Jellil Mirza, who was son of Shahrokh Shah, the son of Rizah Kuli Mirza, eldest son of Nadir.

From Ahmedi to Bunder Abassi it is four stages, namely—

Teng-e-Zendan	} In all about 27 fursacks.
Kushghan	
Ser Khan	
Bunder Abassi	

The old traveller Marco Polo, 600 years since, described the road from Kermán to Hormuz, near Bunder Abassi, and it is probably that which is now usually taken by caravans, namely—

Kermán to Kharin	6 fursacks.
“ Nigar	6 “
“ Kaleh Asker	7 “
“ Baft	5 “
“ Deshtab	6 “
“ Del Serd	5 “
District of Ahmedi	9 “
And from Ahmedi as above	27 “

—
71 fursacks.

The number of 7 stages after quitting Kermán agrees with his account; likewise the descent during two days, that through the Teng-e-Zendan, 4 fursacks S. of Ahmedi. The city of Camandu at the bottom of the descent may perhaps be identified with the ruins of a town, of which I heard, situated at the southern extremity of the Pass of the Teng-e-Zendan, which opens into the country of Kushghan and Takht; of which, however, I could not obtain the name. The appellations of places and districts given by Marco Polo on this line of road cannot now, I believe, be generally identified, but certain other particulars agree with what at present is observed. The francolin is found in those parts. The oxen, in some of the neighbouring districts at least, are, as he states, taught to bend down to receive their burthen, and they

have the hump over the shoulder. Dates are abundantly produced, and the villages, as in his time, are generally either walled in or protected by a fort. But the diabolical tale of the old traveller, relative to the savage tribe of Carauna and their enchantments, by which they procured sudden darkness in order the more easily to attack and rob travellers, I found no trace of. The whole country is dry and parched, and therefore not subject to fogs by which to account for any phenomenon of sudden darkness. The plains S. of Ahmedi are intensely warm, as he has described them.

29th January.—I had intended proceeding from Ahmedi by the lower or Gherasir road leading to Forghan, Tarum, Furg, Darab, &c. to Shiráz, but was informed that such was the state of the country from the ravages of the insect *Simi*, that it would be impossible to procure provender and other provisions for several stages. My horses were already very much out of condition from insufficient food.

Our route from Ahmedi* led us about N.N.W. towards the mountains by a path, stony in parts. At $1\frac{1}{2}$ mile we entered a deep pass leading at first N., and here I observed some large fossils, funnel-shaped and fold within fold; the pass greatly expanding as we advanced, and containing bushes of various kinds and a few benneh trees. At $3\frac{1}{2}$ m. we ascended the rocks by a difficult and dangerous path, in which some of our baggage-mules fell, occasioning us much delay in unloading and reloading them; 8 or 10 minutes would otherwise have sufficed to take us to the summit, from whence we descended immediately into a small plain, the surface of which, at first perfectly sterile, was, farther on, sprinkled with tufts and bushes, but exceedingly

* Distances and bearings.

	Miles.		Miles.
340° 350°	1	Ascend valley side 75° and 10°	
Enter pass N.	$\frac{1}{2}$	over hills	$\frac{1}{2}$
320°	$\frac{1}{2}$	Spring of water N. over hills	
275 260° 270°	$1\frac{1}{2}$	and 340°	1
To top of pass	$\frac{1}{2}$	25° up ravine—85° and 50° ..	$\frac{1}{2}$
328° by descent to plain ..	$\frac{1}{2}$	Descend 55° and N.	$\frac{1}{2}$
N. 30° E.	2	340° 290° 325° down a valley	$\frac{1}{2}$
N. 25 E.	$1\frac{1}{2}$	345°	$\frac{1}{2}$
N.	$1\frac{1}{2}$	N.	$\frac{1}{2}$
45°	$\frac{1}{2}$	Enter plain of Orzu 335° 345°	
20 and 320° to a pass ..	$\frac{1}{2}$	325°	$1\frac{1}{2}$
N. 10° E. 40° and N. ..	$\frac{1}{2}$	300° 325° 340°	$1\frac{1}{2}$
E.	$\frac{1}{2}$	335 345	2
20° 5° 10°	1	330 335	$1\frac{1}{2}$
17 10° 15° 10°	$1\frac{1}{2}$	350	$\frac{1}{2}$
340	$\frac{1}{2}$	345 355°	1
315 300°	$\frac{1}{2}$	345	$\frac{1}{2}$
355	$\frac{1}{2}$		
80 100°	$\frac{1}{2}$	To Dowletabad	30 $\frac{1}{2}$

stony. The plain stretches E. and W., and is apparently of no great extent: our way across it led us N. 30° E. and N. 25° E. to some low hills, where we proceeded along the dry bed of a salt stream, where fossils resembling a honeycomb are abundant. At $9\frac{1}{4}$ m. we entered a pass through red hills, winding through which, by a gentle ascent, we crossed at the 14th mile the valley side and immediately afterwards proceeded N. 10° E. over hills. At the 15th mile we turned off the road to our right to a sulphurous spring of water, which, though extremely nauseous to the taste, is still used by travellers for want of better. This part of the country I thought would be interesting to a geologist, but I am not sufficiently acquainted with the nature of rocks to give any account of it. We continued due N. over the hills for a space, and, at the 16th mile, proceeded up a narrow rugged ravine in direction between 85° and 50° , presently reaching its summit, thence by a gradual descent 55° E. and N., and down a valley between the points W. by N. and N.W. by N., to a clump of palms at $17\frac{1}{4}$ m.; then N. until we entered the plain of Orzu at the 18th mile, proceeding over a stony tract by a slight descent, of which the bearings are given in the margin. This is an extensive plain, running in length E. and W.; its southern side is covered with bushes, and is very stony, but towards the centre it is of a light, fine soil. I was enabled to take bearings up to about $25\frac{1}{4}$ m., after which the darkness prevented my making any further observation until we alighted at the little fort of Dowletabad, surrounded by a village of huts composed of branches and reeds, at the end of the 30th mile. There was difficulty in obtaining any quarters whatever; a servant I had despatched in advance with a letter from the Rais of Ahmedi was admitted, after some delay, through the gate of the fort; and after my arrival the chief of the place and principal people waited on me. They pretended civility, but their language was uncourteous, and they remarked that my people had not brought a proper introduction from the chief of Ahmedi. I replied that, being a traveller and a guest of their sovereign, no such letter was required, and that I should not accept their grudging hospitality, but pay for all I required. They then pretended that no offence was meant, and that the country was at my disposal. We found the people here in all the noise and excitement of a marriage; rude music, and ruder mirth and cheering, were kept up till late, and the women were observed industriously engaged at the hand-mills preparing flour for the entertainment, which lasts during 12 days.

The district of Orzu extends 8 or 9 fursacks each way; it contains 7 little village forts, generally surrounded by huts of boughs and reeds. These forts are real strongholds, the possession of which secures that of the territory around, and as life is held

very cheap in these parts, they are guarded with the greatest jealousy. The revenue is 1200 tomans, and the produce of the fields consists of the articles usually found in the south of Persia.

Bearings from Dowletabad, as pointed out:—

Forghan, S.W., beyond mountains of Lar, 8 fursacks off.

Gushik, a fort, N. 15° E., 8 fursacks off.

Khahre, part of Aktá, N. 15° W., 16 fursacks distant.

Aktá, district, N.

30th January.—We were early off in a direction of 300°. * The plain to the W. of Dowletabad is more or less overgrown with a species of juniper, and the francolin and game of the deer species abound. Four miles and a half brought us to a copious canal stream, close to the fort of Kaderabad, where I purposed breakfasting, but we were immediately surrounded by a crowd of the curious, a great many of whom were armed, and form a garrison to the fort against the inroads of the people of Lar. The chief man here had a gun, the lock of which was that of an old English musket, bearing the name of Wilson; the rest of the warriors were armed chiefly with the matchlock. Finding it impossible to get my meal in quiet there, although the people were civil and respectful, I bade them adieu, and proceeded again in a direction of 300°. The fort is rather picturesque at a distance, but these mud structures seldom bear a close inspection: the habitations are such as I have described at Dowletabad.

Passing an encampment of Afshars, at the 8th mile we proceeded parallel with mountains half a mile distant to our right; towards the 12th mile these mountains receding to the N., form a wide recess of the plain, of which at this part and at Dowletabad the width is the greatest. At the 14th mile, Allahabad, a lately abandoned fort, bore due N. 1 mile distant; and N. 10° W. were the snowy mountains of Khahre, a division of Aktá, which, notwithstanding its mountainous character, abounds with fruit groves,

* Distances and bearings.

	Miles.		Miles.
300°	1½	290°	1
305 300°	3	To Kahn Mahomedí.	
Kaderabad.		300° 250°	1½
300° 295°	2½	295 280	½
280 275	1½	250	1
280 parallel with mountains		270	1½
to our right	2½	255	1½
265	1½	265	2
240	3	270	1
270 and 285°	2½	To Sultanabad.	
209	1½	280° 300°	1
285	3	280 to 300°	2½
305	½	To Kaleh Na.	
285	1½		
290 280°	3		

of which the pomegranate, almond, pistachio nut, grape, and figs are the principal productions. The habitations there are of mud and stone. At the 15th mile we reached some rocks, several high ridges of which interrupt the plain at this point, running N.N.W. and S.S.E. The juniper-trees had become scarcer in this part. At 18½ miles the deserted fort of Orzu bore N. 5° W. about 2 miles distant. Presently afterwards we passed the ruins of two small forts and some fruit-gardens. At 19½ miles occurred the fort of Kahn Mahomedi, belonging to Afshars, who speak Turkish. N. 20° E. from thence was the ruined fort of Orzu, the people of which occupy huts near it. A good deal of land was under cultivation in this part of the plain, watered by copious canat streams. At the 26th mile we reached the small fort of Sultanabad, and at the 30th that of Kaleh Nu, where I met with a very kind reception from Mahomed Ali Khan, the chief of the place. My cattle were so knocked up with the journey and want of sufficient food, that I was forced to give them a day's rest, and was hospitably entertained by my new friends.

The range marked in our maps as the Jebelabad mountains is no doubt that of Jemelabad of Aktá. Beyond the mountains bounding the plain in which Kaleh Nu is situated, to the S., is the country of Lar. The direction of Forg was pointed out on a bearing of 210°, 10 fursacks or 40 miles distant, and that of Târem 15 fursacks or 60 miles in the same direction.

The people in these parts hunt the francolin on foot, shouting and making all the noise they can when the bird rises, which frightens it to such a degree that it is easily captured alive.

February 1st.—From Kaleh Nu* we marched 1½ mile to Zearet,

* *Distances and bearings.*

	Miles.		Miles.
320° 325° to Zearet	1½	310°	1
315 across plain	1½	305 to 315°	½
310	½	Rishghir 1 mile dist. 210°.	
315 to Desht-Bir	1	350°	½
280 270°	1½	300 to Mahomedabad	½
280	½	300	½
N.W. and 265°	2	High road between Yeard and	
270° 275°	2	Bander Abassi.	
305	4½	325°	½
270 by shallow valley to watch		345 315° to Aliabad	½
tower	2	345	1½
290°	½	310 345°	½
280	1	Quit high road.	
300 to a well	½	340°	½
300 to a watch tower	½	To Gishkoh.	
300	1½		
265 and 275°	½		
265	½		
300	½		
285	1		
		Return to Aliabad	2½
			25½

a small collection of huts, an Imamzadeh, and plantations of palms. I observed also some kunar-trees, and a solitary cypress. This place is situated at the foot of hills which, extending from the S.W. into the plain, reduce its width very considerably. We proceeded diagonally on a bearing of 315° across it, and at the 4th mile reached some huts and the ruined fort of Desht-Bir. At the 8th mile our way lay over a stony plain clothed with tufts; at $14\frac{1}{2}$ m. by a shallow valley, through low hills, occupying the extremity of the plain; at $16\frac{1}{2}$ m. a watch-tower to our left; at $18\frac{1}{2}$ m. a well of water, and presently another watch-tower, after which we crossed an open but uneven tract of country. The flocks in these parts are composed almost wholly of black sheep and goats. At $23\frac{1}{2}$ m. the little fort of Rishghir bore 210° , one mile off; and at the 24th we reached the hamlet Mahomedabad, and immediately got on to the high-road between Yezd and Bunder Abassi; thence $1\frac{1}{2}$ mile beyond brought us to a large round tower and village huts, known as Aliabad, a little to the right of the main road we were on. At $27\frac{1}{2}$ miles quitting this road, we reached at the 28th mile the fort Gishkuh. This proved to be a most miserable place, consisting of a few ruinous hovels, and we were even refused admittance; the people were sulky and uncivil, and on our pressing for quarters, I observed one of the guards coolly priming his matchlock. We continued, however, our negotiation, but finding there was no provender for our horses to be procured there, we were forced to retrace our steps to Aliabad, where its owner Kerbelae Dad Ollah received us kindly but roughly, providing all we required, and giving us a berth in his tower. This place he had only recently built, to remove to from Gishkuh, in consequence of his father having been murdered there by the order of Ali Naghi, Khan of Lar, in order to gain possession of his property, which object he effected. The assassin employed, however, was afterwards slain by Kerbelae Dad Ollah.

From hence to Bunder Abassi are $33\frac{1}{2}$ fursacks, to Yezd 80 fursacks, and to Kermán 40 fursacks. This measure varies a good deal in these parts, namely, from 3 to 4 miles per fursack; between Yezd and the Gulf I believe that 3 miles per fursack may be reckoned.

February 2nd.—Quitting Aliabad,* and regaining the high-

* *Distances and bearings.*

	Miles.		Miles.
355° and N.	$\frac{1}{2}$	340° Hamlet $\frac{1}{2}$ mile to right . .	1
N. 20° E.	$\frac{1}{2}$	N. to pond	$\frac{1}{2}$
N. 10 W. to N.	2	N.	$\frac{1}{2}$
N. 15 W.	1	N. 15° E., 20° E., and N. . .	$1\frac{1}{2}$
Tower and garden.		N. 10 E.	$1\frac{1}{2}$

Mountains

road leading to Yezd, we proceeded by a gradual ascent northwards. This part of the country is in summer frequented by the wild ass, but at other seasons the presence of the pastoral tribes scattered over it scares the game. The plain we presently traversed was clothed with tufts of the gum tragacanth plant, and with scattered bushes of the wild almond, &c. At $2\frac{1}{2}$ miles we passed a tower and garden belonging to an adjoining hamlet embosomed in trees, which a mile farther on we left a little to our right. Here we overtook a cosseid or foot-messenger from Bunder Abassi, who had been $4\frac{1}{2}$ days on the way. At the end of the 5th mile we alighted at a pond of good water, possessing two trees and some cultivation near it. At the 8th mile the mountains of Khabre (part of Aktá) bore exactly E., distant probably 25 miles. At the 9th mile, still continuing northwards, we reached some low hills, and traversed them by a broad passage and an easy ascent, gaining the summit at the 13th mile. Here we entered the district of Sirjan, and proceeded by a gentle descent through low hills in a direction a little E. of N. until the 14th mile, when, reaching a plain of great extent, we continued northwards. Finding we could not reach any village before nightfall, at about the 20th mile we turned off the road across the country in a direction of 60° , reaching at the 25th mile (7 fursacks) the ruined mud fort of Kúm, near which some Afshar black tents were pitched belonging to Yeni Ali Khan, who is chief of about 300 families of that tribe. We were kindly received by his brother Abdul Hussein Sultan.

This part of the country abounds with *jerboas* and marmots, which have perforated the land in such a way as to render riding difficult. The plain becomes Kevvir or Salt Desert farther on, and is often frequented by the wild ass. It is bounded on the W. by the country of Darab, and, being destitute of water excepting that of wells, is an uncultivated tract on its southern extremity.

The highway for caravans between Yezd and Bunder Abassi, which we had travelled on this day, is said to be at one point only impracticable for artillery, that is at the Pengheh Zaugh, between

	Miles.		Miles.
Mountains of Khabre bore E.		N. 10° E.	$1\frac{1}{2}$
N. to low hills	1	N. 15° E.	$\frac{1}{2}$
350° N. and N. 5° W.	1	N., N. 10° E., and N. 5° E.	$\frac{1}{2}$
N. 5° E. and N. 5° W.	$2\frac{1}{2}$	N., and N. 10° E.	$\frac{1}{2}$
Top of Pass—		A small fort $\frac{1}{2}$ mile to right.	
Descend N. 5° E. and 10° E.		N. 10° E.	$\frac{1}{2}$
to Great Plain	$4\frac{1}{2}$	N. 60° E.	$4\frac{1}{2}$
N. 50° E.	$\frac{1}{2}$	To Kúm.	
N.	$2\frac{1}{2}$		<hr/> 25

Saidabad and Gurch, a narrow pass of 3 fursacks in length, very rocky, and overrun by water. The road by which guns are therefore taken to or from Bunder Abassi is by Kermán, the position of which is about S.E., and not S., from Yezd.

February 3rd.—From Kúm* we took a cross path leading on a bearing of 75° at $1\frac{1}{2}$ mile into a high-road, different from that by which we travelled yesterday. It led us northwards over the plain, which for a space was bare kevvir, but farther on was clothed with bushes for several miles. On the way we breakfasted at some black tents, but the water drawn from wells with which the people supplied us, was so filthy and thick, that we could not use it for tea. At the 21st mile the village of Abbassabad lay three quarters of a mile to our left, and at the 23rd that of Salabad 1 mile on the same side, half a mile N. of which is a white isolated rock rising from the plain. At the 24th mile the small village Darestan occurred, and at the 26th that of Malekabad, where we alighted. This place is almost destitute of trees, but many of the villages of this plain possess gardens and groves of trees. I took from thence the following bearings:—

Bulverd, village, N.E., 5 fursacks or 15 miles distant.
 Ezenetabad, do., 335° , $1\frac{1}{2}$ mile distant.
 Hassansabad, do., 320° , 3 miles distant.
 Sang Amerabad, white rock in the plain, 195° .
 Rivanabad, village, 195° , 1 mile distant.
 Akabad, do., 185° , 2 miles distant.
 Kalch Sang, another isolated rock and ruins, 330° , 6 miles distant.
 Shah Feeruz, a mound and tower, N. 5° W., $4\frac{1}{2}$ miles distant.
 A wide expanse of plain to N.W.

The district of Sirjan is said to extend N. and S. 24 fursacks, and E. and W. 22 ditto. It is one of the most flourishing of the countries of Kermán, and contains about 41 villages, and a great many hamlets, of 42 of which I obtained the names. The village of Pariz is noted for the hawks reared there, and for its ancient mine of turquoise, which is no doubt the one alluded to by Marco

* Distances and bearings.

	Miles.		Miles.
75° to high road	$1\frac{1}{2}$	330°	$2\frac{1}{2}$
40°	$\frac{1}{2}$	320	$\frac{1}{2}$
N. 20° E. and 15° E.	$1\frac{1}{2}$	345 and 335°	$3\frac{1}{2}$
N. and N. 10° E.	1	325	$\frac{1}{2}$
N.	$2\frac{1}{2}$	310	$\frac{1}{2}$
N. 11° W.	$2\frac{1}{2}$	330	$\frac{1}{2}$
N. 10° W. and N.	1	340 to Darestan	$\frac{1}{2}$
335	$\frac{1}{2}$	340	$\frac{1}{2}$
N.	$\frac{1}{2}$	N.	2
335	$\frac{1}{2}$	To Malekabad.	20
N. 30° E. } off high road	$\left\{ 2\frac{1}{2} \right.$		

Polo, but it is no longer worked. The district possesses copper and lead ore, and abounds with game.

A remarkable tract of salt, like a vast field of ice, is situated to the W. of Saidabad, of which I shall give further particulars hereafter.

The productions of the fields are similar to those of other parts of the country.

February 4th.—Quitting Malekabad,* we encountered a caravan of 370 camels on their way from Yezd to Bunder Abassi, laden chiefly with madder-root, cotton, assafoetida, and almonds; and we passed a second company of about the same size soon afterwards. At the 2nd mile we reached Ezetabad; at the 5th Tadjabad. We then turned off the road in a direction 290° to visit the rock and ruins of Kaleh Sang, which we reached in half an hour. The rock is of considerable size and height, rising from the plain, and is of crystallized limestone. It is encircled by a low wall, with towers at a distance, varying in breadth, and probably not exceeding 100 paces; and on the eastern side a second wall is carried out to a distance of 170 paces from the inner one. The spaces between both walls and the rock are occupied by the ruins of houses of unburnt brick, but nothing remains standing excepting some defences which crown the highest part of the rock, partly of burnt, partly of sun-dried brick. I could learn nothing regarding the history of this place, excepting that its origin is attributed to Feruz Shah, one of the Sassanian monarchs; no one knew when or how it was destroyed; it must have been an inconsiderable place. A fragment of the rock, sculptured and formed into a pulpit with steps, is found on the northern side.

We proceeded over a sandy tract of desert, in which we presently lost our way, in consequence of the clouds of dust and sand-drift caused by the gale which has raged since yesterday; reaching some tents, we procured a guide, and at the 12th mile got again on to the high-road we had missed. We then proceeded on a bearing of 295° , passing, $1\frac{1}{2}$ mile farther on, the village Jellalabad. At the 16th mile those of Feruzabad and Makeabad, about three quarters of a mile to our left; then Gliadgar and Kushkabad,

* *Distances and bearings.*

	Miles.		Miles.
330° 350° to Ezetabad	2	295° to Jellalabad	2
350	4	295	$\frac{1}{2}$
315	$1\frac{1}{2}$	300	$\frac{1}{2}$
330	$\frac{1}{2}$	305	1
335° to Tadjabad	1	320	1
350	1	335	1
290° off road to Kaleh Sang ..	2	To Saidabad.	—
N. 35° E.	3		18 $\frac{1}{2}$
260° on to high road again ..	1		

also to our left. At about the 18th mile we reached Saïdabad, the principal village in Sirjan, containing some 500 houses, and a small bazar of 150 shops, 20 or 25 of which latter retail the manufactures of Manchester. A number of small traders with the country around reside here.

From Saïdabad to Kermán is a distance of 34 fursacks; to Darab, 27 or 28 fursacks; Shehr Babek, 15 fursacks.

The direction of the town of Kermán, as pointed out by the people, was about 40' from this place; that of Yazd about 340°: that of Pariz, where the turquoise-mine exists, N. 5° E., distant 35 or 40 miles; in that vicinity also the *ghez*, which yields manna, grows abundantly.

Situation of Darab, about ..	50°	beyond snowy range of mountains.
" Shehr Babek, ..	315,	15 fursacks.
" Kaleh Sang, ..	S.E.,	10 miles distant.
" Nejefabad, village,	140°,	8 miles distant.
" Akberabad, do.,	155,	8 "
" Feruzabad, do.,	175,	2 "
" Makenbad, do.,	185,	14 "
" Deh Yadgar, do.,	190,	1 "
" Abadeh, do.,	240,	1 "
" Jaferabad, do.,	285,	2 "

From 325° to 290°, a wide expanse of plain and clear horizon.

Tuppeh Shah Feruz, a mound, 120°, 12 miles distant.

Mountains of Pariz, from N. 25° E. to N., some 30 miles distant.

From 350° to 335°, a range of mountains belonging to Shehr Babek.

From 325° to 330°, small range E. of Shehr Babek.

Snowy mountains of Khabre, S.E., some 60 or 70 miles off.

Range of mountains bounding plain—

One extremity 50 to 55 miles distant, 290°.

One " 27 to 32 " 230°.

Kuh e Tymur, small range bounding plain, 50° to 95°.

February 6.—From Saïdabad* we started with fine frosty weather on a bearing of 255°, and presently passed some ruined villages destroyed, as my guide informed me, by an invasion of

* Distances and bearings.

	Miles.		Miles.
235°	2½	Commencement of Great Salt Field.	
S.W.	1	248°	1½
260° to Deh Nu Balla	1½	220°	1
273 255° 250°	1	240 225°	1
W.	1	245 255°	6
S.W.	1	Quit Salt Field.	
W. by N.	1	250° 260°	2
W. 5° S. and W.	1	Quit main road.	
250°	1	310°	1
255 and 270° to Deh Nu Pain	1	350 along another high road	2½
260 to Khaneh Amri	1½	Quit ditto N. 30° E.	1½
273 285° 290°	1	To Kheirabad.	
260 and 265	1½		26½

Afghans, but he could not say at what period. At 3½ miles we reached the village of Deh Nu Balla, and 3 miles beyond that of Deh Nu Pain: 8 miles brought us to the nearly uninhabited village of Khaneh Amré. The plain was generally very barren and gradually resolving itself into salt desert. At 10½ miles we reached the edge of the keffeh or great salt field for which this plain is remarkable, and which is one of the most singular tracts I have ever seen. As I believe I am the first European who has crossed it, I will describe it minutely. At first it presented the usual appearance of salt-lands in this country, consisting of a rotten; soft soil, more or less whitened with soda; in one part it had drifted like sand into a ridge, and had just the appearance of a sandhill. The ground was sprinkled with tufts, but these entirely disappeared as we proceeded, and no symptom of vegetation occurred for the remainder of the way across. Our baggage cattle, which had preceded us, were distorted by the mirage into the appearance of lofty trees, and the deceptive resemblance of water, with the neighbouring mountains reflected in it, was seen in the same direction. This latter is one of the most remarkable effects of the mirage, and I never elsewhere observed in a totally arid tract the appearance of an inland sea or lake surrounded by wooded shores, and having the shadows of trees and other objects which had no reality reflected on its placid visionary surface—a phenomenon which never fails to produce on the mind a most pleasing effect. I think it may be thus explained in some degree. Where the causes which produce the mirage are most intense everything on the surface of the plain is lost sight of, and an expanse of what appears to be water is the consequence; but towards the edges of that space in which the causes are in operation, the diminished effect of these latter admits of the usual appearance of distortion and elongation of every object which may be exposed to them, in consequence of which every little tuft or bush in the plain is magnified into a tree, and the shadow of each (however small) undergoes the same exaggeration to the view; thus one has an expanse of water, with banks and trees and their shadows reflected. Occasionally a small mound or elevation in the plain becomes in appearance a wooded island.

We proceeded by a hard, smooth path worn in the otherwise soft, rotten soil; in rainy weather the keffeh becomes impassable, and the whole tract a mere morass or bog. I observed that wherever rainwater had collected or flowed in streamlets, a beautiful incrustation of salt was the result. As we advanced, the path for a while lay through a deep layer of loose salt, and then commenced the most notable part of the keffeh. The loose salt gave place to a sheet of the same substance, hard and highly crystallized,

and not yielding to the tread of a horse, though at first only one or two inches in thickness; beneath it was brine, mud, and water. Poles or stumps of trees placed at intervals guided us on our way, but presently we lost all traces of a path, and travelled over one wide expanse or field of salt, on which the horses' tread left no impression, and which resembled the surface of a frozen sea. The salt, however, was everywhere cracked into sections of from half a foot to 3 and 4 feet in diameter, in the form of pentagons, hexagons, and heptagons, and the brine beneath oozing through the cracks marked them more distinctly by a slightly raised edge. In the midst of this singular tract one almost loses sight of land. N. and S. were clear expanses of salt, and were it not for the neighbouring mountains on the W. one might fancy oneself in the midst of an interminable frozen ocean. The length, as reported, is from N. to S., 6 fursacks, or 21 miles; but to the S.E. it spreads out into a very wide expanse. Its breadth at the part where we crossed was about 6 miles. I endeavoured when in the midst to ascertain the depth of the salt, but having no proper instrument for digging into it, was obliged to relinquish the effort after piercing with difficulty to a depth of $3\frac{1}{2}$ inches. I was subsequently informed that it is 12 or 15 inches deep. My servants, who had traversed Persia in every direction, had never met with any similar spot, and it is undescribed in our maps and books. Towards the W. side the surface was one unbroken sheet without a crack, its crystals sparkling in the sun, the heat and glare of which were inconveniently felt.

After getting again upon the hard plain, at the 20th mile quitting the main road we struck across the country in a direction of 310° , after closely approaching the hills. At the 21st mile we reached another high road, and presently afterwards, leaving it, turned towards the small fort and village of Kheirabad, where we alighted at the end of the 27th mile, having been obliged to travel about 5 miles out of our way to reach an inhabited spot. It proved a wretched place, consisting of a claybuilt fort and about 15 hovels, in which 25 families of Beluch were crowded. These people are from the neighbouring country of Fars, of a race anciently transported to that province. The fort was, as usual, strictly guarded, and we were refused admittance into the interior portion of it.

Bearings and positions.

Shehr Babek, as pointed out, 345° , 12 fursacks, or 42 miles off.

Pariz, N. 35° E.

Kuh Punj, a high range in the distance on the Kermán road, 70° .

Kuh Kazar, also a high range, 90° .

The villagers here brought me the skin of a wild ass lately killed near this, measuring from the ears to the root of the tail

6½ feet. The skin was of a light fawn colour, with a streak of dark brown along the back from head to tail; belly white; tail two spans in length, with hair at the extremity, and very thin. The coat more resembled fur than hair, and was short and close; the mane only 1½ inch in length. The ears longer than those of a horse, but smaller than those of a tame ass. The villagers called this a wild horse. The fact is, the asses are named according to their size, the smallest only being termed asses, the next in size mules, and the largest horses. The wild ass has no streak across the shoulders.

7th.—After a sleepless night, occasioned by the vermin in our miserable quarters, I rose in little humour for travelling. Proceeding on a bearing of 220°, and crossing a broad recess of the plain, we entered the mountains, and presently observed a herd of deer.* At the 6th mile two roads occurred, one leading direct to Kutru and the other on a bearing of 260°, by which we proceeded through a broad valley more or less clothed with bushes and the benneh-tree, which bears a small fruit with a stone and kernel; the latter is eaten, and from the tree a resin is obtained. A small species of hare is found in this part, similar to what I have before described. At 17½ miles, having reached the head of the valley, we found a deep well of good water, where, by means of a stable-bucket and a rope, we obtained some of the contents to refresh ourselves and cattle with, this being the first water we had met with since the morning. Here we entered the territory of Fars, and proceeding by a gentle descent still through a valley, shallower than the preceding one, we presently observed two herds of wild asses, consisting of about 8 each. The nearest to us separating into two divisions, I gave chase to the one of these which consisted of the leader of the herd, a magnificent animal, remark-

* *Distances and bearings.*

	Miles.		Miles.
220°	2½	N. 310°	1
225	3	290	1
225 through mountains, two		280 295° 300°	1
roads	1	270	1
260° 270° 255° 260° 265° along		265 255°	1½
broad valley	3½	260 245	2
270°	3	260 235	2
270	1½	255	1
260	1	245	1
270	3½	275	1
260	1	245	1
265	1	260	1
270	1	250 260° 270°	1
To head of valley. A well here.		To Beshneh.	
270° by gentle descent through			
a valley	2		

able for his size above all the rest, and two others. After a short gallop I approached within about 50 paces of them, but my horse was already fatigued, and though I kept up with their long heavy gallop I could get no nearer, and fired at them without effect. This incident gave me a poor opinion of the speed of the wild ass, the belief in which is common amongst Europeans, whilst many Persians have assured me that they are not so remarkable for swiftness as for their long wind and endurance—qualities which give them a great advantage over the mounted horse in an open boundless country. With a short start only, I should think they might be overtaken by any well mounted horseman.

The assafœtida plant grows in this part of the country in great abundance, and attains a finer growth than any I have elsewhere observed, some of the plants being 4 or 5 feet high. It is entirely neglected by the people.

Gradually we got into a more open country by continued descents, and at 28½ miles we alighted at the small village Besbueh, possessing some towers of refuge. The distance is called 9 fursacks.

February 8th.—We proceeded on a bearing of 280° down a valley much occupied by the ghez-trec, and possessing a salt-streamlet.* Near some inclosed vineyards on the way we found a numerous colony of partridges; and at the 3rd mile proceeded on a bearing of 210°, over a plain of great length, N. and S., the mountains on the western side forming a vast amphitheatre, the convexity of which points about S.W.; the plain more or less studded with low bushes, but in parts salt and sterile. At 15½ miles we alighted at Kutru, beyond which we could not proceed that day, there being no inhabited place for many fursacks on our way beyond it.

This village possesses two forts, the older one occupied by houses, the other only by the families of the chief people and proprietors here. There is also a large and what has once been a good guest-house, now falling to ruin.

Bearings from Kutru.

Vezirch, small village	.. .. .	18	miles distant, 145°.
Sudrabad, do.	.. .. .	2	" 175.

* *Distances and bearings.*

	Miles.		Miles.
280° by valley and salt streamlet	½	210° and 215°	5½
280	½	205 and 190 salt barren tract	4½
190	½	195 salt barren tract	½
225	1	190	½
270	½	185	1
210 over great plain	½		15½
215	½		

Kaleh Khan, small village $\frac{1}{4}$ mile distant, 240° .
 Termination or point of mountains bounding this plain on W. 120° .
 Kallatu, an isolated high rock in the plain, 30 miles off on the road
 between Darab and Sirjan, 115° .
 Keffeh Mur, another and smaller rock in plain about 20 miles off, 112° .

February 9th.—From Kutru we proceeded on a bearing of 260° and 275° , the plain clothed with the gum-tragacanth plant.* At the 2nd mile we entered a deep and wide ravine through the mountains, and proceeded by a gradual ascent in direction 275° . This pass abounds with bushes and the benneh and wild almond trees, which give covert to quantities of partridges; and our ride was rendered very pleasant by the scenery, and the notes of several birds. The 6th mile brought us to the top of the pass, from whence we proceeded by a gentle descent over an open tract between hills, the country still clothed with tufts and bushes. At $12\frac{1}{2}$ miles we descended through a narrow, tortuous valley by a very rough road and considerable slope, towards the end of which occurred some plantations of pomegranate, walnut, and other trees, nourished by a streamlet of very clear water. At $15\frac{1}{2}$ miles ascended again a quarter of a mile, when we came in sight of the Lake of Neyriz, or Kheir, stretching nearly N.W. and S.E. apparently, though only a part of it was visible: the delight one feels at the sight of any considerable sheet of water in these arid countries must be experienced to be understood. We descended by a bad and rather steep road, on a general bearing of 270° , reaching the bottom of

* *Distances and bearings.*

	Miles.		Miles.
260°	$\frac{1}{2}$	320° and 285°	$\frac{1}{2}$
275°	$1\frac{1}{2}$	305 and 320	$\frac{1}{2}$
Enter deep Pass.		305	$\frac{1}{2}$
275°	$1\frac{1}{2}$	300 and 330	$\frac{1}{2}$
270°	$\frac{1}{2}$	To plantations.	
253°	$1\frac{1}{2}$	305° 285°	$\frac{1}{2}$
By windings of valley from		270° ascending come in sight	
220° to dar N. to top of		of lake	$\frac{1}{2}$
ascent	$2\frac{1}{2}$	Descend 270° to bottom of de-	
325° by gentle descent through		scend	$\frac{1}{2}$
hills	$\frac{1}{2}$	280° across plain	$\frac{1}{2}$
320°	$\frac{1}{2}$	265	$\frac{1}{2}$
300	$\frac{1}{2}$	250° to pond	$1\frac{1}{2}$
310 and 325°	$\frac{1}{2}$	230	$\frac{1}{2}$
300 305° 285° 290°	2	225 and 230°	$\frac{1}{2}$
310	$\frac{1}{2}$	240	$\frac{1}{2}$
Descend through narrow tor-		230	$\frac{1}{2}$
tuous valley in general di-		To Neyriz.	
rection N.	$\frac{1}{2}$		$21\frac{1}{2}$
320° and 340°	$\frac{1}{2}$		

the pass at the commencement of the 17th mile, and then proceeding along the plain over very rough ground. At the 19th mile, alighting at a circular pond, I despatched a servant in advance to procure quarters at Neyriz, which bore from thence S.W.

A village fort in the plain, called Kaleh Selfabad, bore 265°, 2 miles distant.
 Do. do. Jáferabad, N. 40° W., 6 miles distant.
 Portion of the lake visible, between points W. 50° N. and W.N.W., distant about 8 miles—the lake appearing from hence as though shut in by mountains on all sides excepting the W.

We reached Neyriz at the end of 21½ miles of difficult road, and here I met with my servant, who had not been very courteously received by the people of the governor, Hadj Zein ul Abedin Khan, and was churlishly told, in reply to his application for quarters for me, that there was a caravanserai in the place. This was the first instance of incivility I had met with from any one in office on this journey; and, having subsequently complained of it to the governor of Shiráz, an apology was made. I took up my quarters in a *medressch*, which afforded fair accommodation.

From Neyriz to Eej, across the mountains, is a distance of 4 fursacks, or 12 miles. The district of which Neyriz is the principal place, had suffered greatly from the ravages of locusts for two successive years. The productions of the country are much the same as those generally of other parts of Persia—namely, grain, millet, cotton, tobacco, and palma Christi, but not in great quantities, there being a scarcity of water; the plain is therefore little cultivated. Fruits, however, are abundant and cheap. The district extends about 30 miles E. of the town by the way we came. Lead-mines are found in its hills.

Neyriz itself is a poor town, containing about 1500 families, including those of its three adjacent forts. It occupies a considerable space with its gardens and houses in a corner of the plain near mountains, and on the south-eastern extremity of the lake, from which it is distant about 7 miles. In some of our maps it is erroneously placed on the northern shore. Its bazar possesses some forty or fifty shops and three caravanserais, but the former are of the meanest description. Though this place is on the high-road between Shiráz and Kermán, such is the limited nature of the traffic between the two places that we had not encountered a single caravan in all the distance between Sirjan and Neyriz.

The lake, which is in many European maps marked as that of Bakhteghan, is known on the spot as the Deriah, or Sea of Neyriz or Kheir—the latter from the name of a neighbouring village; sometimes it is called Deriah i Nemek (Salt Sea). I could never find that it is called Bakhteghan, nor is there seemingly any place of that name in the vicinity.

February 10th.—From Neyriz * we proceeded over an uncultivated plain, passing at $4\frac{1}{2}$ miles the village of Khajeh Ahmed, situated 1 mile off to our right at the foot of a lonely rock. At the 5th mile the village of Kaleh Nu bore due N. 10 miles distant; that of Rustak, 350° , 2 miles off; and Kaleh Shur, N. 5° E., 3 miles distant. We were then travelling parallel with mountains about 2 miles off to the S. $6\frac{1}{2}$ miles brought us close to some rocks rising from the plain; and here was a considerable tract under cultivation, belonging to the above-named villages, and small encampments of Eliats, living however as Rayats on the soil. At $9\frac{1}{2}$ miles occurred the small fort of Ay Yovan, unoccupied, but surrounded by black tents. From hence the eastern extremity of the lake bore N. 30° E., but the water then reached only to N. 10° E., it being low at this season. Another point of the lake bore 280° , about $2\frac{1}{2}$ miles distant. The shore at this part runs E. and W., and the expanse of water is about 3 miles in breadth. On the N. it is shut in by a line of hills and mountains, and for a considerable distance on that side

* Distances and bearings.

	Miles.		Miles.
285°	1	280° 295°	2½
275	½	(Here the direction of the shore	
280	1½	was from 115° to 295° .)	
290	½	270° 280°	1
285	½	275	½
270	½	270, leaving the lake	½
265	½	275	1½
270	½	270 265°	½
290 270° 285°	½	260	½
Village Khajeh Ahmed 1 mile		265 270° 275° 280°	½
distant.		295	½
270° 285°	½	275	½
Village Kaleh Nu bore 360° ,		285 270°	½
10 miles distant. Village		290	½
Rustak 350° , 2 miles distant.		To village Mabarekabad.	
Kaleh Shur N. 5° E., 3 miles		275°	½
distant. Mountains 2 miles		Lake appeared to terminate at	
off to South run in a line		this point, having taken a	
with the shore.		bend due N., and some rocks	
270° 265°	½	shutting out the view of its	
270	½	continuation W.	
260	½	295°	½
275 to rocks	½	290 260° 270°	½
275	1½	To ruined village Seraj.	
265	½	330	½
285 265°	½	305	½
280 295 to Ay Yovan	½	to Kheir.	
285 270	1		
295 305	4½		

its shore was completely whitened by the presence of innumerable water-birds, chiefly swans and flamingos, which latter were also seen wading far into the water in search of their prey. Many dark lines indicating shallows were visible, and on these also the birds collect. The oyster-catcher is seen abundantly, but is very timid. The water of the lake is extremely salt, and in summer leaves a thick saline deposit on the mud. The shores have no sandy beach, but soft fine mud; and I did not observe a single shell.

A high range of mountains, called the Kuh Khojeh Malli, 30 to 36 miles off, bore from Ay Yovan between the points 335° and 350° . The 16th mile brought us close to the water, and here was another vast collection of aquatic birds. Thence the road led parallel and close to the lake for some distance, a range of mountains on our left running in a line with it about 1 mile distant. The accompanying bearings will show the previous and subsequent direction of the shore, $18\frac{1}{2}$ miles having led us gradually from it. Twenty-three miles and a half brought us to the village Mubarekabad, and at the 24th the lake appeared to terminate at a bearing due N., but this was not really the case; its southern shore had taken a bend northwards, and the presence of some high rocks shut out from view the continuance of the water to the westward; it was at this point about $1\frac{1}{2}$ mile distant. At the 25th mile we reached the ruined mud village-fort Seraj, surrounded by cultivated land; thence 305° direct to Khir, which village we reached after a ride of 26 miles. This, too, was a ruinous-looking place; the people complaining that they were frequently plundered by the Kashgai tribe; and the place swarmed even at that season with vermin and mosquitoes, the latter of which I could not protect myself from, until I had lighted a fire of straw in my room and smoked them out.

The people pretend the lake contains no fish, or any living animal: this I should doubt, seeing the number of flamingos which wade in it; and it is not improbable that in the mud are found, as in the salt lake of Orumieh, polypi and other living creatures, upon which the birds may feed. In dry summer seasons the water is entirely evaporated, and its bed may then be traversed on foot. The water, which is almost entirely derived from the Kur (known to us as the Bund Amir river), is clear. The beautiful and graceful flamingo appears nearly white at a distance, and it is not until it takes wing that the scarlet and black of its wings are much perceived.

Bearings from Khir.

Village	Dest-Jerd ..	..	..	..	N. 15° E.	$\frac{1}{2}$ mile distant.
"	Bangh ..	..	..	..	205	$1\frac{1}{2}$ "
"	Mufferghan ..	..	..	..	200	$1\frac{1}{2}$ "
"	Meymauch ..	..	..	..	210	2 $\frac{1}{2}$ "

The lake on this side runs N. and S. to a point bearing from

hence N. 20 E., and a faint line of water is seen extending westwards.

Kheir is situated in the district of Istahvonat, or Savonat, which extends from the southern border of the lake at this part some miles beyond the mountains, where the small town of Istahvonat is found, on a bearing from Kheir of about 140° , 12 miles distant. The productions consist of barley, wheat, rice, millet, Indian corn, cotton, and tobacco. Walnut and sycamore trees flourish in this part, and there is one of the latter of remarkable height and girth at Istahvonat, the measurement of which, as given me, was 45 feet in circumference at 2 feet from the ground. Istahvonat possesses eight villages; the climate is remarkably mild in winter, as is that of all the circumference of the lake. The porcupine is found there, as in many other parts of Persia.

February 11th.—We had a long march to perform, and quitting Kheir* continued westward, near the mountains on our left and parallel to the lake on the other hand. The 4th mile brought us

* Distances and bearings.

	Miles.		Miles.
W. near mountains to left, and lake to right	$\frac{1}{2}$	320° 315° 310° and 295° and 310° ..	$2\frac{1}{2}$
300 ^o	$\frac{1}{2}$	320	$1\frac{1}{2}$
310 290° to deserted fort ..	$2\frac{1}{2}$	To Khaneh Kird	
290	$\frac{1}{2}$	300 ^o 310°	$\frac{1}{2}$
To foot of mountains.		295°	$\frac{1}{2}$
300 ^o	$\frac{1}{2}$	320 and 300 ^o by ascent ..	1
320	$\frac{1}{2}$	295	$1\frac{1}{2}$
285	$\frac{1}{2}$	265 Pass abreast of island,	
295	$\frac{1}{2}$	then over low hills	$\frac{1}{2}$
To spring of tepid water.		285° 255°	$\frac{1}{2}$
345 ^o	1	300	$\frac{1}{2}$
305	$1\frac{1}{2}$	265 and 260°	$\frac{1}{2}$
310	$1\frac{1}{2}$	250	$\frac{1}{2}$
325	$\frac{1}{2}$	270	$\frac{1}{2}$
295	$2\frac{1}{2}$	250	$1\frac{1}{2}$
Bend in the shore N.		235	$\frac{1}{2}$
315	$1\frac{1}{2}$	260 250° 235° 240° ..	1
275	$\frac{1}{2}$	Cross small spur of mountains	
320	$\frac{1}{2}$	on left, and the Pool-e-	
315	$\frac{1}{2}$	Talkh (Bridge), then 310°	
310	$\frac{1}{2}$	over plain	$\frac{1}{2}$
355	$\frac{1}{2}$	290°	$3\frac{1}{2}$
335	$1\frac{1}{2}$	Large mound called Kaleh	
310	$1\frac{1}{2}$	Turenji.	
305	$\frac{1}{2}$	290° 280°	3 $\frac{1}{2}$
Short bend in the shore N.		Chenar—deserted village, 270°	
340 ^o	$\frac{1}{2}$	and a little S. of that point,	
345	$\frac{1}{2}$	until we alighted at Kheiro-	
330	$\frac{1}{2}$	meh	$4\frac{1}{2}$
315	$\frac{1}{2}$		
335	$\frac{1}{2}$		46 $\frac{1}{2}$

to the foot of the former, when we proceeded on a bearing of 300° , and reached a spring of tepid water at the 6th mile. The benneh-tree, ghez, and wild almond abound in this part. I found it impossible to obtain correct bearings of the shore, from its flatness and irregularity, and the mud preventing one's approach to the water's edge; but we had been travelling nearly parallel with it, and the annexed bearings will show the variations. At the 12th mile the shore took a bend northwards; hitherto from Kheir the water had appeared to be from 2 to 3 miles across, subsequently it became much diminished in width, but apparently less shallow: a second bend northwards occurred at the 19th mile. Khaneh Kird, consisting of a tower, a ruined caravanserai, and a well, occurred at the 24th mile; thence, by a gentle ascent over a hard stony road, we crossed some low hills and passed abreast of an island nearly divided in two. An extensive view is here obtained of the lake spreading to the S. and W. At the 29th mile its southern extremity bore 270° . At the 33rd we crossed a spur of the mountains on our left, close to which a little bridge, known as the Pool-e-Talkh, marks the boundary between the districts of Istahvonat and Kúlbar, or Kúrbale, which latter extends to Bund Amir, 11 fursacks E. and W., and about 4 fursacks N. and S. Here we entered upon an extensive plain formed by the recession of the mountains to the S., a fine level tract, over which we proceeded at first on a bearing of 310° . Thus far we had constantly the mountains close to our left, and the shore of the lake equally near on our right; we were now receding from both; and it was not long ere we gave chase, but ineffectually, to a herd of twenty-five antelopes. At the 39th mile we arrived at a large artificial mound, called Kaleh Turenji, which in the days of Nadir Shah was crowned by a fort; here we and our cattle assuaged our thirst with some indifferent water. Thence, on a bearing of 290° and 280° , we passed at $42\frac{1}{2}$ miles the deserted village Chenar, ruined the year before by the Arab and Baharlu tribes after the death of Mahomed Shah; but for three years past the tribes had been plundering the country. We had fondly imagined that one of the above two places might be our station for the night, but, finding no inhabitants, we continued on in direction 270° , the last bearing I was able to take, owing to the approach of night. Afterwards the road led a little to the S. of that point until towards the end of the 47th mile, when we alighted at the large village Kheirumeh, after being $10\frac{1}{2}$ hours in the saddle. The distance is called 12 fursacks.

At this village I was told the length of the lake is 19 fursacks; this measure differs a good deal in these parts, but has latterly been equal to 4 miles.

In these parts we frequently pass small burying grounds where there are no habitations; these belong to the Eliats, who at this season are for the most part in the warmer districts farther S. Wild animals make great havoc in these places of interment, and yesterday I remarked one grave torn open, the shroud of the body and the hair of the deceased lying scattered about the plain. At the 17th mile we passed the village Kheirabad, three-quarters of a mile to our right, and here we quitted the district of Kûl-bar for that of the city of Shîrâz (the Homai Shehr). At the 20th mile the village of Yezd Khast occurred, $1\frac{1}{2}$ mile to our left; and at the 22nd mile we were parallel with the eastern extremity of a range of rocky mountains intersecting the plain in a direction E. and W., 1 mile to our right. The 24th mile brought us near the village Du Deh, and soon afterwards we came to a tract of turf, moist and boggy, and intersected by small deep streams. The country here is studded with wells, the water of which is raised for irrigation. We reached Darien, a good village, at the 27th mile, reckoned at 7 fursacks. Here the houses are as usual mud-built, but covered in with reeds, which are plastered over with earth. The people have imagined hearths, but have omitted chimneys to their abodes.

February 13th.—As we were quitting the village I heard a person remark that I was riding without a saddle. I have overheard the same bright opinion before. A European saddle lies so close to the horse's back, and is so little seen, that Asiatics are sometimes led into the above mistake; and when they have discovered their error they ask if it is possible to ride fast on such a seat. Seeing us mounted on such saddles, they form the most contemptible opinion of European cavalry; and certainly nothing can be in greater contrast, than their own and our saddles and mode of riding: their seat is soft and high, and with a demi-peak in front, and the stirrups very short; ours low, smooth, hard, and comfortless. The Persian horse-equipage is preferable in many respects: the sharp corner of the shovel stirrup-iron serves instead of spur; the demi-peak is convenient for throwing the rein over when one dismounts, and for which the bridle is purposely shortened; both bridle and bit are single. The saddle is supplied with thongs, with which to fasten cloaks and other objects required on a journey; and a breastplate and crupper are standing parts of the equipment. The saddle is prolonged behind into a covering which keeps the horse warm in the loins; and one leather girth is all that is required to keep the whole of it fast. On such a saddle a Persian looks almost a part of his horse, snugly and firmly seated, no protuberance of ungainly-looking legs and feet; and he is enabled to turn himself about in his seat and perform a variety of

curious feats which it were useless to attempt on a European saddle. The latter is, however, better adapted to fast riding and to leaping.

The village Laibesheli is situated $1\frac{1}{2}$ mile from Darien, on a bearing of 345° .* At the 1st mile we reach low hills, and passed the village Kushk-e-Mullah a little to our right; crossed hills and immediately descended into a narrow plain, of no great extent, running E. and W. At the 8th mile we entered by a broad pass through mountains, commencing by a gentle ascent near the western extremity of the plain; the pass widened into a broad valley. At $14\frac{1}{2}$ miles we descended by a very stony road leading through the mountains; and at the 21st mile, approaching the poet Saady's tomb, I was met by a small party, composed of the two young nephews of the Eel Khanee (the chief of all the tribes of Fars, and a former acquaintance of mine) and their attendants, who had been sent out by their father to welcome me. Other people met me at different parts of the route; and, quitting the valley, we entered a plain of no great extent, N. and S., in which Shiráz is situated. I entered the city gate after a ride of about 25 miles, and, proceeding through narrow uneven streets, reached the house of the agent of our legation at Tehrán.

My general report contains further particulars of Shiráz and of the province of Fars.

KEITH EDWARD ABBOTT.

Tehrán, June 7, 1854.

Distances and bearings.

	Miles.		Miles.
290°	$\frac{1}{2}$	285° 265° 205°	$1\frac{1}{2}$
295°	$\frac{1}{4}$	270°	$\frac{1}{4}$
270, low hills—village Kushk		305° 315°	$\frac{1}{4}$
Mullah. Cross hills into		300°	$1\frac{1}{2}$
small plain running E. and W.		Descent by bad road through	
290° 270° 290° 290°	2	mountains 305°	$\frac{1}{2}$
275°	$\frac{1}{2}$	290°	$\frac{1}{2}$
270° 280°	$2\frac{1}{2}$	295° 275° 270° 280° 260° ..	2 $\frac{1}{2}$
270°	$1\frac{1}{2}$	280° 290° 295°	$1\frac{1}{2}$
Enter broad pass through		290° 260°	$\frac{1}{2}$
mountains— 265° and 285°	$\frac{1}{2}$	240°	$\frac{1}{2}$
305° 275° 280° , pass widening		260°	4
into broad valley	$1\frac{1}{2}$	To Shiráz.	
305° ascent	$\frac{1}{2}$		24 $\frac{1}{2}$
275° 270° 265°	$\frac{1}{2}$		



II.—*Explorations in South Africa, with Route from Walfisch Bay to Lake Ngami, and Ascent of the Tiojé River.* By CHARLES J. ANDERSSON, Esq.

Read, Nov. 27, 1854.

ON my return to Walfisch Bay in company with Mr. Galton, towards the close of 1851, I took the liberty to address a letter to the Secretary of the Royal Geographical Society, representing to him my intention of proceeding on an exploring expedition from Walfisch Bay, offering, at the same time, to make inquiry upon any geographical or other point that the Society might think worthy of their notice. I had the pleasure of receiving a very kind letter from Dr. Shaw, assuring me that the Society would be glad of any information, however small, that would tend to clear up anything relating to the as yet, imperfectly known geography of the African continent. With this assurance, therefore, I venture to lay before the Society the result of a journey to Lake Ngami, and an overland trip through Great Namaqua-land to the Cape of Good Hope. But as I laboured under peculiarly difficult and embarrassing circumstances throughout the whole of this undertaking, there is much that I must beg the Society to view with indulgence. First of all, I have to apologise for the very imperfect language used in this narrative, as I can only boast of being half Englishman.* Secondly, my means were very inadequate for such an enterprise as the one in question, and I have had to struggle hard to enable me to accomplish it. Thirdly, the servants that I engaged for the journey, proved a most worthless set; there was not one that I could trust with any matter of importance, and consequently I was more or less dependent on myself. Indeed, from the procuring and preparing of my food, to the observations of the heavenly bodies, it was all *my* work, for when I did not actually cook the food, I was at least obliged to see that it *was* done. Again, when about half-way to the Lake, a mutiny arose among the men, and they insisted upon returning, and it was only by a good deal of inconvenience and difficulty that I succeeded in dissuading them from following their inclination; bad as they were, I could not well do without them. Fourthly, the country through which a great part of my road lay, was, at the time, in a most deplorable state, fighting, robbery, and murder being of common occurrence. In addition to which, the Namaquas viewed with jealousy and distrust every attempt that was made to open a communication with Lake Ngami through their territory, having been told by the Griquas, that such a thing would be highly injurious to their (the Namaqua)

* Mr. Andersson was born in Sweden.—Ed.

interest, inasmuch as the English would, in such a case, be sure to take possession, not of the Lake district alone, but also of their lands. Fifthly, at the outset of my journey I was but indifferently acquainted with the use of instruments, and much time for practice could ill be spared during my many and various occupations. Moreover (before getting half-way to the Lake) I had the misfortune to break my chronometer, and my *last* watch within a day or two of Lake Ngami; the consequence was, that I was unable to obtain a single longitude by observation. By applying myself, however, to the most careful dead reckoning, I succeeded in fixing the most important places with a very fair approximation to truth; at least I am led to believe as much, as by comparing my observations with those of Mr. Galton, wherever it could be done, I found that they never differed more than a very few miles. Adding to this, the usual difficulties that a traveller has to encounter in newly-discovered countries, and it will easily be conceived that the task I had imposed on myself, was not easy to accomplish.

In his address to the Society, Mr. Galton has stated that the object of my remaining in Africa was for the purpose of collecting specimens of natural history. Originally something of this kind was perhaps my intention, although never entirely; but I soon found that a journey of *any description*, in these parts of the world, would necessarily involve me in very considerable expense; and not being a person of independent means, I did not think there was sufficient reason for me to make the expedition on that ground alone. By uniting geographical researches with those of natural history, however, I thought the result—should the expedition prove successful—would not be without its good both to myself and to the world at large. Having once come to such a conclusion, I acted accordingly.

When parting from Mr. Galton, at Walfisch Bay, it was my full intention to have started at once for the interior, to follow up, if possible, what he had so ably begun; but at the time I was disappointed. To accomplish my object it was necessary that I should be provided with articles of exchange, &c.; but as these were not to be had at Walfisch Bay, I had no alternative but to repair to Cape Town, which was the nearest market. Mr. Galton had sailed, and as no more vessels were expected, I determined (to save time) to take the overland route. At the time I had a few indifferent instruments about me, and with these I was in hopes of being able to lay down my route, at least roughly, but again I was disappointed. Being confined to my bed in a small grass hut, erected for the occasion, it suddenly caught fire one evening, and, with the exception of a few trifling articles, such as a good pocket-compass and a pocket-sextant for measuring

angular distances, that were saved, I barely escaped with life. To these instruments I was able, through the kindness of one of the missionaries, to add a watch. Thus I should still have been able to do something, but it appeared as if I was doomed to nothing but misfortunes, for no sooner had I recovered from my wounds than I was attacked by a malignant fever, which brought me to the verge of the grave. I suffered much on this occasion, being, as I was, in an inhospitable country, without a friend, without proper food, and, what was worse, without medicines. Before I had recovered, I was in sight of the Cape of Good Hope colony, and was thus, through unforeseen circumstances, obliged to pass uselessly over a country, several hundreds of miles in extent and almost unknown to Europeans, experiencing nothing but sufferings and disappointments.

At last I reached Cape Town, where I lost no time in making preparations for a fresh start, but I had considerable difficulty in obtaining the necessary instruments. Everything was, however, happily arranged, and I set sail for Walfisch Bay, where I arrived in safety in the beginning of 1853; but some months elapsed before I was able to prosecute my journey.

As my road for some distance lay nearly over the same ground as that travelled by Mr. Galton, it would perhaps only be repetition, were I to enter into details of those parts; I think it will be sufficient to take up the narrative where Mr. Galton left off, or at Otchombindè (Tunobis), our farthest easterly point. Knowing approximately the position of the Lake, I was anxious to take as straight a course as was possible; but the bushmen assured me that if I insisted upon doing so, it would lead to certain destruction of myself, men, and cattle, as the country, through which I intended to pass, was entirely destitute of water. They strongly urged me to proceed in a southerly direction for two or three days' journey, and then to turn northward. Although I did not put entire confidence in what they said, I had no alternative but to act according to their advice. Proceeding alternately on the banks and in the dry bed of the Otchombindè river, the first day's march (June 14, 1853) took me through a partly sandy and partly hard road, and the next day, about noon, brought me to a small well, where the rains being only just over, I got sufficient water for my cattle. At this place I found some waggon tracks, which I have since learnt came from the S., and were made by a party of Griquas and English, who succeeded in crossing the Kalahari desert direct from Kuruman (the same rainy season as I passed through to the Lake), partly in search of elephants and partly with the view of bartering with the natives. Some of them found their way with great difficulty to the Lake, whilst others reached Great

Namaqua-land on horseback; one of the latter served me afterwards as Bichuana interpreter.

Leaving the Otchombindè river to my right, I then took a more northerly direction, and a short half-day's travel brought me to a set of wells in limestone, which, from their dilapidated state, had apparently not been in use for a considerable number of years. However, by cleaning and digging we succeeded in obtaining, from one of these pits, a very fair quantity of good water. Next day's march (a *very* long one) brought me to Ghânze, a fountain in limestone. It used to be a favourite drinking place for the rhinoceros and elephant. The former of these animals are now all shot or driven away, but the latter still continue to resort to it. Ghânze, it seems, has long been known to the Bichuanas and to the Griquas. A party of the latter, I am told, reached it many years ago in a dreadfully exhausted state, having previously been obliged to abandon their waggons; even Europeans had visited it. An English traveller, Moyle, crossed the Kalahari, and arrived at Ghânze, the year before I did, that is in 1852, on a trading and hunting expedition; thence he was guided by bushmen to Great Namaqua-land, whence he retraced his steps home. In 1853 he crossed the desert a second time, but less fortunate, for when within four days of the Otchombindè fountain, he lost all his oxen, and also all the horses, but two. Those of his servants, moreover, who did not die from hunger or thirst, became frightened at their desperate condition, and fled towards Namaqua-land, leaving Moyle and his companion completely destitute. With the two remaining horses they made their way, after great sufferings, to the Otchombindè fountain. Here, to add to their misfortunes, they were ill-used and partly deprived of their goods by a party of Namaquas and Griquas; although I am inclined to think that the latter circumstance arose entirely from their own mismanagement. In this dreadful plight I met them (when on my road back from Lake Ngami), and was fortunate enough to be able to assist them. Since then no news have been received as to their whereabouts or doings. Ghânze is the permanent residence of a number of bushmen, who, on my first arrival, showed considerable reluctance to communicate with us; but by supplying them freely with meat and tobacco, they soon became very friendly.

From Ghânze (with the exception of a little drinking-water once for ourselves, and that was of the most horrible quality) we got no water for *two entire nights and days*, and the cattle were in a very exhausted state, when we fortunately reached a small fountain. Two hours' farther travelling brought us to Kobis, a splendid watering place; a sort of *vley*-fountain situated in limestone. The water is abundant and of excellent quality, and the grass in

great quantity. Before the Kubabis Hottentots attacked and plundered a Bichuana cattle-post, it used to be regularly resorted to by the latter with their cattle. Even the Damaras are said to have extended their wanderings to this point. It is now solely occupied by bushmen, who were here more numerous than in any *one* place that I have seen either in Namaqua or Damara-land. In a physical respect, moreover, they are far superior to their southern dwarfish brethren. Many of them have really fine features, and figures without a blemish. Although exceedingly well behaved towards myself, they nevertheless, on more than one occasion, exhibited a fierce spirit and violent temper. I have seen *their* chief exchange arrows with another bushman captain in defence of *my* property, while his people, on more than one occasion, have threatened to stab my men without the slightest provocation, simply because they were not allowed to carry away the best part of such wild animals as I might have chanced to kill. I found them very honest, for during my whole stay at Kobis (and that was a considerable time) I never missed a single article; and when I ultimately departed for the Lake, I had occasion to leave a good deal of property with the chief, and, to the best of my knowledge, I did not lose as much as a pennyworth. By judicious and kind treatment, I find that a bushman—degraded as he is—is not entirely deprived of a proper sense of gratitude; for instance, before I left Kobis, the bushmen, in a body, presented me with a fine assegai, “as a token,” as they expressed themselves, “of their gratitude for the kind treatment that they had experienced at my hands during my stay there.”

At Kobis I found an extraordinary number of wild beasts congregating nightly, chiefly rhinoceros and elephant, no doubt on account of the almost total absence of water in the neighbourhood. My stay at Kobis was prolonged far beyond my own wish, through an unforeseen accident, having, in an encounter with a mortally wounded black rhinoceros, received severe wounds and bruises. For some time I was unable to move without assistance, and fearing that a considerable period might elapse before I should be sufficiently restored to proceed on my journey, and the distance to the Lake not being great, I knew but too well—that the chief would soon hear of my arrival, and, therefore, to prevent any misunderstanding, I determined upon sending some of my men to the chief of Lake Ngami, to inform him of my motive and my intention to visit him, accompanied by a few trifling presents. After a week's absence the men returned (having met with a favourable reception), with a request that I should hasten my departure; and as soon as I had recovered sufficiently to be able to mount my ox (the substitute for a horse in that part), I was but too happy to comply with his wish. My first day's march from Kobis, July

10th, lay through heavy sand, covered with an exceedingly dense hakis thorn coppice, and crossed in every direction by numerous rhinoceros' and elephant foot-paths. The second day brought us to a fine *vley* of water, where I was glad to find a number of influential Bichuanas waiting to conduct me to their chief. They had orders, moreover, to render me any assistance I might require, but whether this was done from interested motives, or from courtesy, I am unable to say. Each of these Bichuanas was provided with a shield of ox-hide and a bundle of assegais. They had Caffre features, and were generally well formed. At this place a vexatious incident occurred, which might possibly have led to a very disagreeable result. On meeting the men above mentioned we bivouacked at the *vley* in question, where a great number of bushmen happened to be encamped. Just as I had retired to rest, a little English boy that I had in my service, came in great haste, saying, "Please, sir, the Bushmen tell us that Sebituane having heard of our coming, had sent a message to the chief of the Lake, with orders to send people to waylay and kill us, and that these"—meaning the Bichuanas—"were the very people ordered to do it!" Being myself pretty well used to similarly absurd and unfounded tales, and well knowing that on this occasion I had nothing to fear, I took no notice of it, but again went to sleep with as little concern as if I had been in my own country. But this was far from the case with my men, for the following morning I learned that their anxiety had kept them awake during the greater part of the night, and that some had actually packed up their things, intending to steal away secretly! The next day proved the groundlessness of the report, the Bushmen having fabricated this story as a means of prolonging my stay among them, in anticipation of obtaining an occasional gorge from the spoils of my chase.

On leaving the *vley* we did not follow the few tracks made by the Griqua waggons, as the road appeared very circuitous, but our guides took us a straight cut across the country. Damara-land, it is true, is bad enough as regards bushes, but I am inclined to think that these parts far exceeded it. The hakis thorns were dreadfully thick, and of the worst description. Our clothes, carosses, and even pack-saddle bags, that were made of strong ox-hide, were literally torn to ribbons. From the well on the Otchombindè river to the very edge of the water of the Lake, it is one continuous mass of thorns. It was with the greatest difficulty, and after a great deal of labour, that the first Griqua waggons succeeded in effecting a passage; and although several waggons, besides my own, have since passed through, it is still anything but a good road for them.

Bushy as the country is, it still affords an abundance of good

pasturage, and that it has been extensively resorted to in former times, both by Damaras and Bichuanas, the numerous old wells and pits bear ample testimony. Wherever limestone appears, there will also some of these wells be found: they closely resemble those met with throughout Damara-land, but the Boshmen say that they were dug by the Bichuanas.

A long day's journey from the *vley* brought me to some rising ground, from which I had a magnificent prospect of the Lake—at least of its western extremity, which had then all the appearance of a vast ocean, only bounded by the horizon. Whether my expectations had been raised to too high a pitch, or the grandeur of the Lake and the luxuriance of the surrounding vegetation had been somewhat embellished, I must confess that, on a closer inspection, I felt a little disappointed. It is true I visited it in the dry time of the year, a season, of course, very unfavourable for judging of its beauties, if it possessed any. The E. side is certainly, in point of beauty, far superior to the W., or where I struck it. The Lake itself is undoubtedly a noble sheet of water, but its size has been somewhat overrated, and the misconception may be accounted for. In the first instance no person, to the best of my knowledge, has ever yet been *quite* round it; secondly, the shores, with the exception of the S. and W. sides, are low and sandy, and in hazy weather cannot easily be distinguished; and lastly, I am inclined to think that the discoverers mistook its length for its breadth, for according to Cooley, "the travellers beheld with delight the fine river, and the Lake extending out of sight to the N. and W." The whole circumference of the lake is probably 70 geographical miles, its average breadth 7 miles, and not exceeding 9 at its widest parts. From circumstances I was prevented from making a regular survey of it, but as I travelled *nearly* round the whole of it, I can speak with some confidence on this point. Its shape, moreover, is what I have represented in the map, narrow in the middle, and bulging out at the two ends; and I may add that the first reports received many years since from the natives about the Lake, and which concurred in representing it of the shape of a pair of spectacles, are correct.

I was civilly received by Letcholétébè, chief of the Lake, who has lately removed his capital to the N. bank of the Dzuga, for fear, it is said, of some of his southern neighbours. For the first day or two after my arrival Letcholétébè eyed me with suspicion, and peremptorily refused to give me the slightest information about the country, but by degrees, as he found that the real motive of my visit was merely to explore the country, he became more communicative. I seized the first favourable opportunity to ask him to allow me to proceed northward without delay, being particularly anxious to visit a place called Libèbé, not so much

to see the place itself, as to be able to collect some information as to the source or sources of those mighty waters to the N., and also to ascertain whether any communication with the sea existed. Several individuals had, on former occasions, offered him valuable presents if he would bring them there, but under different pretexts he had always excused himself from complying. I was therefore somewhat surprised when he agreed to my proposal without the slightest objection or stipulation, which led me to suspect that all was not right, and the result showed that I was not mistaken in my conjecture.

A party of Griquas, whom he had also refused to assist, had already of their own accord penetrated to Libèbé, but they had paid dearly for their independence; for out of the party, which consisted at the outset of the journey of 20 souls, only *one-half* survived!—having been attacked by a malignant epidemic fever. Their horses and cattle were, moreover, bitten by the tsetse fly—that scourge of South Africa—the consequence of which was the abandonment of two of their waggons; with a third they effected a precipitate retreat to Lake Ngami, where they arrived in a dreadfully exhausted state; and there the *last* ox and horse died! It seems not improbable, however, that a road might be found free from this insect; for, strange to say, the Griquas, in going to Libèbé, did not lose a *single* horse or bullock, and therefore, had they returned by the same route, they would in all likelihood have saved the whole of their cattle, &c.

A party of English traders and hunters attempted, contrary to the advice of Letcholètébè, the same year, to reach Libèbé, but they had only proceeded a few days' journey N. of the Lake when both horses and cattle were stung by the tsetse, and they were compelled to make a hasty retreat. Warned by their failures, I determined to proceed by water, if possible; but as I had no boats myself, I requested Letcholètébè to provide me with canoes and men to guide me. This he also kindly agreed to, and after only $3\frac{1}{2}$ days' stay at the Lake I set out. The first and second day we passed on the Lake, sleeping at night on the damp beach with but a very scanty supply of fuel. It is in reality but one long day's journey; but as the wind was rather high, we could only proceed the latter part of each day, when the wind usually abated. I observed here a rather curious phenomenon, which undoubtedly may lead many to suppose that the Lake is subject to ebb and flow, but which, I believe, is simply to be attributed to the wind, which, according to the quarter whence it blows, forces the water in a contrary direction. Every night, before retiring to rest, we always took the precaution to unload the canoes of our most important baggage, and to pull the boats as near the strand, as the shallowness of the water permitted us.

The Bayeye told me that further precautions were unnecessary, as the water (which had already begun to ebb) would shortly recede, and leave them dry on the beach. During the night it fell calm, and next morning we found that what the boatmen had predicted was fulfilled; the canoes were *as far from the water as they had on the preceding evening been far from the shore!* As soon as the wind abated the water began slowly to return, and about 9 o'clock in the morning it was at its usual height, and the canoes floated once more without any effort on our side.

On arriving at the mouth of the Tiogé, although it was fast filling at the time (August), we were obliged to drag the canoes across the bar by main force; but by going a mile or two more to the westward, where a channel is said to be navigable at all seasons, this inconvenience might have been avoided. About a mile or two from the bar, the Tiogé spreads out in several small branches, very narrow, flowing with a velocity of 3 to 4 miles per hour. Before starting from the Lake I was assured by the Bayeye (or Bakobas, as they are usually designated by the Bichuanas) that on account of the enormous and constant windings of the river, I should be some months in getting to Libêbé; but as they are well known for their deceitfulness and lying propensities, I did not give much credit to their story. In this *one* instance, however, I found that they had spoken the truth very fairly, as during *thirteen* days that I ascended it, travelling on an average 5 hours per day, and reckoning 2½ miles to the hour, I only made about *one degree of latitude due N.* of the Lake. Indeed, I have on more than one occasion, perhaps after a whole day's travel, been astonished to find myself close to the spot that I had left early in the morning!

For the first few days the country along the Tiogé presented a rather dreary and monotonous appearance. It is frequently flooded for miles and miles, thus converting the land on both sides into extensive reedy marshes, occasionally relieved by a pleasant group of palm-trees. Fuel was scarce, and could only be obtained from the natives, who not unfrequently brought it from a very great distance for remuneration; and the banks were thinly inhabited. On our 4th day's journey the landscape assumed a more pleasing aspect; the banks of the river became higher, and were richly covered with a rank and luxuriant vegetation. The palm, with a few exceptions, disappeared, and gave room to the black-stemmed mimosa, the wild and wide-spreading sycamore, the elegant *moshoma*, and a variety of other beautiful plants and trees, often new to me, many of the latter yielding an abundance of palatable and nourishing fruits. Some of my black servants recognised no less than six or seven different kinds of fruit-trees indigenous to the E. coast and the adjacent countries. The

animal life, as may well be supposed, was hardly less varied and numerous. The leché (a species of antelope first known on the discovery of Ngami), the redbuck, the kudo, the buffalo, the rhinoceros, &c., &c., displayed themselves to our view as we passed. The gigantic hippopotamus began now also to show itself; and though the natives dread this animal, it is not unfrequently speared to death by a sort of monster-harpoon, admirably adapted for the purpose. The encounters with the hippopotami on the Tiogé often end fatally to the harpooners. The frail canoe affords but little protection against its furious attacks: a slight blow of its gigantic head is sufficient to upset the strongest of the native craft. Having myself, when returning down stream, severely, if not mortally, wounded a huge female, accompanied by a calf, she made a bold attack upon one of the canoes, precipitating all the men, four in number, into the water. They were, however, fortunately rescued, but most of my baggage was lost. Mishaps of this kind are not always to be attributed to their wilful attacks, as, owing to the narrowness of many of the rivers, the animal, in coming to the surface to breathe, accidentally encounters the skiff, and in its fright or playful frolic upsets it. Comparatively few people, it seems, are actually killed by the sea-cow itself, but being suddenly thrown into the stream, they are either drowned or devoured by alligators, which abound in the Tiogé. The flesh of the hippopotamus is esteemed a delicacy, and is consequently much sought after by the natives.

In our first journey through Damara-land I had made such a complete collection of its birds and insects, that I almost despaired of obtaining anything new or interesting, but here I found at once an almost unexplored and unlimited field for the naturalist. Unfortunately I was not in a state to be able to benefit to any extent by its abundance and variety. The sickly and hot season was fast approaching, for it was now past the middle of August, my supplies were limited, the natives unwilling to proceed or to lend a hand, the road before me long, and my own servants tired and dispirited. The finny inhabitants of the Tiogé did not present any great variety (they are more numerous in the Lake), nor did we meet with any quantity, but all those that came under my notice proved more or less good eating, and some were of a very delicious flavour. Two or three different species were recognised by my men as inhabiting the rivers of the E. coast and of the interior W. of it. The Bayeye catch them with nets made from a sort of rush which possesses considerable tenacity, and also from the fibrous stalks of a species of aloe, which is found in abundance throughout Great Namaqua, Damara, and Ovampo-land, and the countries lying eastward of them, but which only grows to perfection here. The fibres are of great tenacity, apparently stronger and

more flexible than hemp, requiring less labour and attention in its growth and manufacture.

On the 9th day from the time that we first entered the Tiogé we left the main branch and passed into the *Omoroanga* (small river) *Vavarra*. This rivulet is merely one of those small branches of the main stream so frequently met with, and which are formed by the Tiogé overflowing its banks; they not unusually rejoin it after a day or two. The *Omoroanga Vavarra* is only navigable with canoes when the Tiogé is at its greatest height, and even then the navigation is of the most intricate description. Indeed, the boatmen, who are born and bred in its neighbourhood, constantly lose their road. We slept two nights on it, during which time we were exposed to much inconvenience and hardship.

Letcholètèbè had placed two canoes, with their complements, at my disposal, but the rascally Bakobas had by this time so filled them with their own things, that no place was left for myself, and as the country was one entire succession of swamps, lakes, rivulets, &c., I found myself early and late immersed in water, sometimes swimming, at other times wading up to my neck. But what I lost in comfort was made up in the beauty of the surrounding scenery; wherever the soil was raised a few feet above the surface of the water, it was covered by a rich and majestic vegetation. The natives frequently resort to these enchanting spots for the purpose of hunting and fishing, and to cultivate the ground.

At length we approached a large Bayeye-werft, where their great chief resided, and where I was given to understand that I was to be provided with fresh men and other boats. To save time, the day before my arrival I sent my principal guide to inform the captain of my coming, requesting him to get everything ready; but, on reaching it the following day, I found, to my utter astonishment, that he, with all his men, had set out that very morning for the purpose of hunting the sea-cow; and no one could, or rather *could*, inform me when the chief would return. I at once saw through the trick, and that he was determined not to let me proceed, probably in obedience to secret orders from Letcholètèbè; after waiting a week in vain, and finding that remonstrances were useless, and that I was entirely at their mercy as regards any farther progress, I had no alternative but to retrace my steps as quickly as possible. And though sadly disappointed at their unhand-some behaviour, which prevented the prosecution of my journey, I was nevertheless glad that I had been able to come thus far. I had learnt much in this short time, which I could not have done had I remained at the Lake, to say nothing of the beautiful, diver-

sified, and novel scenery that daily presented itself to the view, in itself a sufficient reward for my trouble.

For a considerable distance northward, the banks of the Tiogé are inhabited by a people called *Bayeye*, and a few scattered Bushmen, all acknowledging Letcholétébé as their chief. Beyond them we find the *Matsanyana*, but whether they form a distinct nation or are a mixture of Bayeye and Matsanyana, I have not been able to ascertain with certainty. N. of the Matsanyana, again, we hear of the *Bavicko* (or *Wavicko*) country, the capital of which is called *Libébé*, from which also the chief derives his name. The Griquas, as before mentioned, with whom I conversed, say that the country about Libébé is flat and thickly overgrown with bush, occasionally relieved by large isolated trees, and that the Tiogé is there of great breadth and studded with beautiful islands, on which the natives chiefly dwell.

Libébé appears to be the centre of a great inland trade. The *Mambari* repair here regularly to barter for slaves, ivory, &c.; they are a tribe probably resident in the vicinity of the new Portuguese settlement at Little Fish Bay, a strong argument in favour of which, or at least that they live in the neighbourhood of the sea, is, that they are frequently visited, for the purposes of commerce, by two different white nations, as they told the Griquas, who found a party of them at Libébé. The one, meaning probably the Portuguese, chiefly barter for slaves; whilst the other, probably the English or the Americans, only take in exchange for their manufactures ivory and other valuable productions of the country. The *Mambari* bring as articles of exchange blue and striped cotton, baize, beads, cattle, &c.

Again we find the *Ovapangari* and the *Ovapanyama* also visiting Libébé for trading purposes. These nations occupy the country N. of the Ovampo. On our visit to the latter in the year 1851 (Galton's expedition), we found them, the *Ovapanyama* and the *Ovapangari*, engaged in trading with this tribe also. The *Bavicko* have moreover intercourse with *Sebetoane*, *Letcholétébé*, and others.

The *Bavicko* are represented as an industrious nation, strictly honest, and of agricultural habits. Their mode of dress appears closely to resemble that of the *Moriza*. They have some slight knowledge of metallurgy; the iron they procure easily and in abundance from their neighbours; but from all I can gather, it does not appear to be indigenous to their own country.

Nineteen days of actual travel were occupied by the Griquas in reaching Libébé from the Lake; six of these were occupied in gaining a small running water, which was said to lose itself in a day or two. By unloading the waggons they were enabled

to pass it, although the water rose above the "buikplank," or bottom boards. Four days and a half farther travelling, holding a N.W. course, brought them to a second river of larger dimensions, but dry at the time. This they followed for a day and a half, but as it took a westerly course, they turned more to the right. Between them and the Tiogé they distinguished a lofty mountain, which is probably "*Sorih*," mentioned by Dr. Livingston. The remaining 7 days brought them to Libèhé.

The last mentioned river presented, as it has been already said, nothing but a sandy, dry watercourse: but should the accounts given of this river, both by Bushmen and intelligent black people, prove to be true, the value of the discovery cannot be too highly appreciated. The Bushmen told the Griquas that near the source it is periodical, but in its course being fed by fountains—a phenomenon by no means uncommon in African geography—it soon increases to a *constantly* running stream, and in due time becomes a mighty river, flowing slowly through the country of several black nations, and ultimately discharges itself into the sea. I should perhaps have hesitated to give credit to their account, had it not, on more than one occasion previously, been corroborated. Some two years ago, whilst on a visit to the Ovampo, and inquiring if there were any permanently running river in their neighbourhood, they immediately and unhesitatingly replied in the affirmative. The Cunènè, they said, was only 4 or 5 days' journey from them on foot, but added, that it was not to be compared with a river that comes out of "*Mafia*" or "*Orationa*" land (clearly the Bichuana country), and of which the Cunènè is only a branch; in their trading excursions they frequently cross this river. This valuable and interesting information was confirmed by the *Ghu Damop*, popularly known as the "Berg" or "Hill" Damaras, who live interspersed in the hills throughout Damara and Namaqua-land.

Again, when Mr. Galton and myself, distant only some 8 or 10 days' journey from the Lake, were obliged to retrace our steps on account of the excessive drought, we were informed by the Bushmen of the existence of a large river to the N., coming from Bichuana-land, and running westward. They further added, that another small river comes from the same direction, but is soon lost in the sand or terminates in a marsh. Now, with the exception that the latter is a branch of the Tiogé (instead of having its source in the Lake in common with the large river as they asserted), their account may be said to have been substantiated. From these statements, the existence of a river, in all probability of great magnitude and perhaps navigable to its very source, or nearly so, is so far authenticated that I have no hesitation in laying it down on my map. The Ovampo gave it the name of *Mukuru Mukovanja*, and in the map attached to Cooley's 'Inner

Africa Laid Open' we find a large river called *Achitanda*, joining the Cunene. These, I take it, are identical; and assuming that they (the Tiogé and the Mukuru Mukovanja) run parallel, though in contrary directions, at the distance from each other of two or three days' journey, as the Griquas informed me, there exists an almost uninterrupted navigation of several hundred miles, affording an easy transport to the sea-coast of the produce of a rich and fertile interior. Thus much for the Tiogé.

The northern shore of Lake Ngami is low and sandy, and devoid of vegetation, without a tree or bush to be seen within the distance of half a mile, and more commonly a mile. The Lake must have undergone a considerable change during the last century. The old Bayeye have frequently pointed out to me places, now covered with vegetation, where they used to harpoon the sea-cow. At another period, in all likelihood before the present change took place, there are unmistakeable proofs of its having been of smaller dimensions, for submerged stumps of trees are constantly met with. The phenomenon is not, I believe, to be attributed to the upheaving or the sinking of the land, but simply to the following reason. In all probability the Lake was originally of somewhat smaller dimensions than at present, when an unusually large flood poured into it from the interior, which, from the flatness of the country, could not be drained off as quickly as it flowed in, but caused it to rise above its usual height, and remaining in that state some time, soon destroyed the vegetation. The southern side of the Lake again, is considerably elevated, and the water is fringed by extensive beds of reeds and rushes, so much so, that the water is only accessible in a few places. The W. end is also somewhat raised, though the water is very shallow, affording a favourite resort to a variety of water-fowl, but deepens considerably towards its eastern extremity, at which it finds its outlet in the fine and stately *Zouga*. A short distance from where it makes its escape from the Lake, the *Zouga* is about 200 yards wide, and from its gentle flow appears at rest, the motion of the stream being imperceptible to the eye. Indeed it is asserted by some—and should it be found correct, it certainly would be a most extraordinary phenomenon—that the waters of the *Zouga* are at one time of the year forced back into the lake by a tributary of the Tiogé,* which thus not only feeds the Lake at its N.W. extremity, as has been already stated, but from the E. as well, which, from the very imperfect development of the water-courses in these parts, I do not think impossible. The banks of the

* In Dr. Livingston's sketch of a map this tributary is called *Dzo*, and is connected with the river *Mubabé*, a branch of the *Chobe*. It is possible that the latter circumstance may have something to do with the supposed refilling of the Lake.

Zouga, and its immediate neighbourhood, are inhabited by Bushmen and Bayeye, part of whom acknowledge Letcholetébè as their chief.

The people that dwell on the shores of Ngami form a small Bichuana tribe, called *Batoana*, &c., whose chief is at present Letcholetébè. They are said to have been once conquered by Sebetoane, and to have fled from his dominion under the conduct of the present chief's father (who was a great warrior), and arriving on the shores of Ngami, they dispossessed the inhabitants, and reduced them to a state of slavery, giving them a name corresponding to their capacity, viz., *Ba* or *Makoba*, or "serfs." In their own language, however, these call themselves *Ba* or *Wayeye*, that is "men."

The Batoana-Bichuanas are an idle race. The tilling of the ground, and all drudgery in general, are left entirely to their slaves, the Bakobas and the Bushmen. Hunting, however, is a favourite pastime with them, and their only *real* occupation; the remainder of their time is passed in dancing, eating and drinking, and sleeping.

These Bichuanas are rich in sheep and goats, but possess comparatively few horned cattle. Like other tribes of that nation, they are excessively fond of their oxen, but more particularly prize their *cocks*, which nothing, I believe, could induce them to part with, and will readily give ivory, when plentiful, in exchange for cows.

The only marketable articles, as yet ascertained at the Lake, are ostrich feathers, skins of various sorts, rhinoceros horns, and elephant and sea-cow ivory. Beads and *ammunition* are the only staple articles of exchange. Clothing is as yet but very little in demand, the people not being sufficiently advanced in civilisation to care for this luxury.

A large variety of game is found in the neighbourhood of the Lake, and two species of antelopes, new to science, have been discovered. In the Bayeye language they are termed *Onja* (Leché in Bichuana) and *Nabo*. Its flora appeared both varied and luxuriant; but as my visit was unseasonable for observations on that head, I am unable to furnish the Society with any farther particulars than have already been mentioned in these pages.

The Bayeye, whom Mr. Cooley supposes originally came from the W. coast, have apparently been established at the Lake for a considerable period, if not from time immemorial. They are tall, and of a robust form, of a sooty complexion, and very ill-featured. The men have adopted the dress of their conquerors, which consists simply of a piece of skin, broad in front, tied round the waist, with a tassel attached to it on each side falling down over the hips; and in addition to this they wear a skin, or light caross, which

they accommodate to the body according to the state of the weather. The women again, dress very much like those of the Ovaherero, viz., with a short skin skirt.

The only weapon in use amongst the Bayeye, is a light javelin, having sometimes two or three barbs. In addition to this, the older Bayeye have a shield, made of a single fold of ox-hide; but they have only become acquainted with this means of defence since they were subdued by the Bichuanas: as to the want of the shield they entirely attribute their own defeat.

They are much given to habits of pilfering and lying, as suspicious as deceitful, and, like most black nations, addicted to intoxicating liquors, and fond of the dance. This is commonly a mimic representation of the playful sports and the courting of the different wild animals. They understand the art of making beer from malt, on which they frequently get intoxicated. The men are inveterate snuff-takers, and the women "dakka"-smokers. They live in large round huts, covered with matting made of rushes, and constructed on the same plan as those of the Namaquas. Polygamy prevails amongst them to almost any extent.

Their superstitious notions are numerous, and, as may well be supposed, often very ridiculous; but with regard to these, as well as their religious views, rites, &c., it is most difficult to get any information, as it requires both time and a tolerably good knowledge of the language to enable a person to acquire anything of moment. The little that I gleaned from them on these points would not be sufficient to interest the Society.

In earlier times the Bayeye possessed numerous herds of cattle, but these passed into the hands of the Bichuanas upon their assuming the mastery over the country. They are permitted, however, to rear a few goats, which they do less for the sake of the milk and flesh than for the skins, which they convert into carosses, &c. They also keep fowls, which appear to be of a very ordinary breed.

From the damp and humid nature of the country, although generally speaking they are a healthy race, the Bayeye are at times exposed to rheumatism, and other affections of a like kind. They suffer also severely from ophthalmia, and many of them bear the marks and scars of that fearful disease, the small-pox. The Lake district, in common with the surrounding country, is visited by a dangerous fever, which carries off many of the natives; and being equally dangerous to Europeans, it ought to be avoided during the hot season, or from the month of November to April.

The country inhabited by the Bayeye before their subjection, must have been of great extent, and is still of considerable size, consisting, I believe, of one continued plain, intersected by rivers, with extensive marshes. The banks of the rivers are in general

very low, but wherever they rise a few feet above the level of the water, they are shaded by a rank and wild vegetation; the trees, of a gigantic size, having their stems and branches entwined and interwoven with beautiful parasitical plants and creepers. The soil is fertile, and yields the necessities of life in abundance with little labour. A month or two before the rainy season, the ground for cultivation is selected, cleared, and slightly worked by a small short hoe, the only agricultural implement I have seen used by the Bayeye in tilling. After the first heavy rains they begin to sow the corn, of which there are two kinds indigenous to the country, namely the common "Caffer," and another sort, very small-grained, not unlike canary-seed (akin, I am informed, to the "badjera" of India), which is more nutritious than the other, and when well ground, makes excellent flour. Tobacco, calabashes, water-melons, pumpkins, beans, small peas, are also grown, as well as different kinds of edible earth-fruits, of which the *oiengora* (motu-o-hatsi of the Bichuana, I believe) may be mentioned in particular. This is a sort of bean, having its pods under ground, well known to the Mosambiques, extensively grown by the black population in Mauritius, and is, I am informed, no uncommon article of importation at the Cape of Good Hope. Moreover, the country produces a variety of wild fruit-trees, which serve no less to beautify the scenery, than to afford good and wholesome sustenance to the inhabitants. Among the most handsome and useful trees the *moshoma* stands perhaps pre-eminent, on account of the great height, the straightness of the trunk, and the distance at which it begins to branch out. The fruit is gathered on the ground, exposed to the sun for some time, and when sufficiently dried, is put into a hollow piece of wood (a sort of mortar) and pulverised, and is fit for use at any time by simply mixing it with water. It is then not unlike honey in appearance, and has a sweet agreeable flavour, but must be cautiously used by strangers at first, for if eaten in any quantity, it is apt to derange the stomach. The *moshoma* invariably grows on the banks of rivers, or in their immediate neighbourhood, and may, with the greatest facility, be conveyed down the Tiogé to the Lake. The Bayeye use the timber extensively for canoe-building, and in the manufacture of utensils. I found the *moshoma* growing in Ovampo-land, and I am also given to understand that it is common throughout the countries W. of the Portuguese settlements on the E. coast.

The Bayeye store their corn and other products of the soil, in large baskets manufactured from palm leaves and other fibrous and tenacious materials. The labour of tilling the ground, the process of reaping, the cleaning and the grinding of the corn, fall almost exclusively on the women. The men lead generally an idle life at home, but show great activity in hunting and fishing.

In shape, feature, complexion, &c., the Bayeye appear closely

allied to the Ovampo and the Ghu Damop; but their language, on the other hand, bears considerable resemblance to that of the Ovaherero, and has, moreover, some affinity with the dialects of the East coast, but has two or three different clicks which would seem to indicate a Hottentot origin. As there are undoubtedly many members of the Society who are interested in philology, I subjoin a small vocabulary, trusting that any little errors will be excused, as my stay at the Lake was exceedingly limited, and I besides had no interpreter. The words, though necessarily few in number, have been selected with a view to their utility, and consist chiefly of numerals, those denoting family relations, names of the different parts of the body, familiar objects, &c. I have at the same time given the corresponding terms in the *Otjiherero* (Damara) and the *Chylimanse* (a tribe inhabiting the country W. of the Portuguese settlement, on the E. coast), to show the striking analogy existing between these languages. The nations here mentioned occupy a narrow strip of territory extending obliquely across from the W. coast almost to that of the E.

COMPARATIVE TABLE OF OTJIHERERO, BAYEYE, and CHYLI MANSE WORDS.

ENGLISH.	OTJIHERERO.	BAYEYE.	CHYLI MANSE.
A.			
Arm,	Okuoko,	Engoro,	Maoko.
Arrow,	Otjika,	Itoo,	Moriene.
Arrow-point,	Omuri (which is al- ways fast),	Movi,	Movi.
Assegai,	Engu,	Roanga,	Mafomo.
Awl,	Otjisiui, Ondongo (?).	Etongo,	—
B.			
Bag,	Ondjato,	Eshisi,	Sapo.
Bead,	Ondjendjo,	Sooli,	Ozanga.
Bead of bone,	—	Sen'gama,	Sambo, Dalira.
Bean,	Ekunde,	Memba,	Njemba.
Beard,	Orujethu,	Indexo,	Indero.
Belly,	Eshuri,	Ora,	Mimba.
Beer,	—	Oara,	Wadoa.
Bow,	Outa,	Kota,	Outa.
Bow-string,	Omuko,	Kazenga,	Ozenga.
Boy,	Omutthando,	Morombana,	Morombala.
Breast, woman's,	Evere (sing.), Omar- ere (pl.),	Mavere,	Mazuku.
Brother, eldest,	Erumbi,	{ Mopanga (?), Moratnaya (?), }	Amzatsi.
Brother, younger,	Omangu,	—	Morombala.
Buffalo,	Onjati,	Onjati,	Onjati.
Bush-tick,	Ongupa,	Zenkopa,	—
Buy, to,	Okuranda,	Koora,	Kogola.
C.			
Calabash,	Ondjupa,	Kad'gava,	Fongue.
Cap, or covering for the head,	Ekori,	En'kava,	Chapeo.

COMPARATIVE TABLE of OTJHERERO, BAYEYE, and CHYILMANSE WORDS—*continued.*

ENGLISH.	OTJHERERO.	BAYEYE.	CHYILMANSE.
Cattle,	Onjanda (sheep and goats),	Dashangava wa-nume (?),	Ngombe.
Chest,	Ornkoro,	Zedzuva,	Chifoa.
Child (infant),	Omuvena (male infant),	Nana,	Moana.
Chopper or hatchet,	Ekava,	Enkakara,	Badzo.
Cold,	Ombepera,	Ompepo,	Ompepo.
Copper,	Otjiserandu,	En'koa (?),	—
Corn,	—	Mavere ("Caffer" corn),	Mabera ("Caffer" corn).
Corn (somewhat like canary-seed in shape and size,)	—	Mano'kos,	Mavere, Mafonde.
Corn-trough, or hollow piece of wood in which the corn is crushed or ground,	—	Chitona,	Noli.
Corn-grinder, crusher, or pestle, with which the corn is converted into flour,	—	Moshi,	Monsi.
Cow,	Onkompè, Onthinda,	Enkaze,	Ngombe (cattle in general).
D.			
"Dakka" (wild hemp),	—	Rovanse,	Banje.
Dog,	Omboa,	Omboa,	Omboa.
Drink, to,	Noa,	Konoo,	Konoo.
Drinking-cup,	—	Kehipi On'kara,	Mokombo.
E.			
Ear,	Okutai,	Koti,	'Nzerè.
Earth-fruit, a species of bean with pods under ground,	—	Oiengora,	Nemo.
Eat, to,	Koria, rian,	Kolia,	Kodia.
Elbow,	Ombarambanja,	Bokokona,	—
Elephant,	Ondjohu,	Ongovo,	Oudzo.
Eye,	Esho (pl. Omesho),	Amesho,	Maso.
F.			
Fasten, to,	Pandeka, Kota,	Shimmina,	Manga.
Fat,	Omathe,	Amazi,	Mafota.
Father,	Tate (isho, your father; ishe, his father),	Tati,	Palea, Bambo.
Fig-tree (wild),	Omukuejamba,	Mokoja,	Makojo.
Finger,	Ominae,	Minee,	Monoe.
Fire,	Omuriro,	Mongiro,	Mosto.
Foot,	Ompathe (from vatha, to reach),	Sikondo,	Niaro.
Fowl,	Ontera (from thetha, to tremble),	Sienjeshi,	Hoko.
Fruit-tree (wild),	—	Moshoma,	Moashoma.

COMPARATIVE TABLE of OTJIERERO, BAYEYE, and CHYILMANSE WORDS—*continued.*

ENGLISH.	OTJIERERO.	BAYEYE.	CHYILMANSE.
Fruit-tree (wild), with large oblong pods,	—	On'oro,	—
Fruit-tree (wild),	—	Se'koa,	—
Fruit-tree (wild),	—	Oi,	—
G.			
Giraffe,	Ombashe,	Ombashe,	Chipembere.
Girl,	Omukathana,	Mokana,	Mosikana.
Gun,	Otjimburu,	Onzodzo,	Palabala.
Goat,	Onkompo,	Opuli (?),	Omboxi.
Gold,	—	Darama (?),	Dalama.
Grass,	Eabothu,	Modzodso,	Maosoa.
Gun,	Ondjembo, Otjimbari,	Tuboro,	Foti (smaller gun, perhaps pistol ?).
H.			
Hair,	Onkise, Ondjse,	Seshyahi,	Sisi.
Hartebeest,	Orukambe,	Onzoro (Bastard Har- tebeest),	—
He,	E, Eje, ie, ma, me, u, ua, etc., accord- ing to the prefix of the noun,	—	Ojo.
Head,	Otjiuru,	Mosoro,	Mosoro.
Hear, to,	Thuva,	Koiva,	Oanson.
Heaven,	Ejuru,	Lero,	Gore, Modenga.
Hide,	Omukoba,	Engoo,	Palame.
Hippopotamus,	Ongantu,	Onvovo,	Onvoo.
Hunger,	Ondjara,	Enjara,	Onjala.
Husband,	—	Arora,	Morome Oange.
I.			
I,	Oami, Ami,	Geme (?),	Ene.
Iron,	Otjitenda,	Otari,	Otare.
Iron ring,	Onkohe,	Tugakano (?),	—
J.			
Jackal,	Ompantje,	Opokojo,	Boro.
K.			
Knife,	Oruvio,	Kaffroe,	Chipanga.
Knobstick,	Onkanja,	Kashan,	Opzimbo.
L.			
Lead,	Ohanga (?),	Oroto,	Opula.
Leg,	Okurama,	Mon'o,	Bumbira.
Lip,	Omuna,	Suporo,	Molomo.
Listen, to,	Paratena,	Koiva,	Oanson.
M.			
Man,	Omurumentu,	Mokorokome,	Morome.
Meat,	Onjama,	Onjama,	Njama.
Milk, sweet,	Omaisii,	Mashutta,	Kaka.
Milk, sour,	Omaire (from jera, to glitter),	—	Koiva.

COMPARATIVE TABLE OF OJHHERERO, BAYEYE, and CHYILMANSE WORDS—continued.

ENGLISH.	OJHHERERO.	BAYEYE.	CHYILMANSE.
Mother, Moon, N.	Mama, unjoko, Omuethe,	MA, Okoeze,	Mai. Moezi.
Nail, Neck, Nose, O.	Ontango, Enkoti, Ejara,	Zengara, Ezongo, Lero,	— Koa. Pono.
Ox, Ostrich, P.	Onkomponaombe, Ombo,	Oporo, Eupofo,	Ngombe (ox or cow). —
"Pheasant" (fran- colin), Pig, wild, Pot, Powder, Pull, to, R.	Ongoari, Ompinta, Oajungu, Osiri, —	Ongori, Ongire, Kahoma, Moshiri, Sherapo,	— Ongulve. Karango. — —
Rain, to, Rhinoceros, Rush, S.	Roka, Ongava, —	Yovoraetena, Oshongodzo, Litjatsa(?), rush from which they manu- facture their mats,	Konnn vola. — —
Salt, Sand, See, to, Sheep, Shoulder, Sister, Sit, to, Sleep, to, Snuff, Spoon, Stand up, to, Star, Steal, to, Stick, Sun, T.	Omnongua, Esheke, Muna, tara, Ontu, Otjitave, — Kara-peshi, Kara, — Orutae, Sekama, Onjose, Yaka, Okati, Ejara (from java to cut or divide), Omajo (sing. Ejo), Ola, ave, Omarisha, { Ku, Ko, K, Pa, Po, } { P, Mu, Mo, M, } Omakaja, Omunue, Eaka,	Ratsoai, Movo, Komoana, Ogo (?), Zeko'aba, Mo'ganyu, Sekama, { Korangara, Terangara, } Motombe, Kato, Gema, Sienjata, Koiva (?), Kati, Leba, Ameno, Goe, Moloo, — Motombe, Zena, Rarime,	Monjo. Setja. Onna. Magai. Mapeo. Bali. Kara. Kolara. Podia. Oluko. Komera. Njeneze. Koba. Paimbo. Dzua. Mano. Eoe. Kolo. Oku. Podia. Minoe. Rarime.

COMPARATIVE TABLE OF OTJHERERO, BAYEYE, and CHYLIMANSE WORDS—*continued.*

ENGLISH.	OTJHERERO.	BAYEYE.	CHYLIMANSE.
U.			
Understand, to,	Thuva,	Daivo,	Dafva, Oansoa.
W.			
Walk, to,	Risaga,	Rakeke,	Kofamba.
Water,	Omeva,	Ami,	Movola.
Waterbuck,	—	Onja,	—
We,	—	Sherako,	Ife.
Wolf,	Ombungo,	Omporo,	Tika.
Woman,	Omakathenda,	Mokaz,	Mokaze.
Woman, married,	Omakathenda Vaku-pua,	Vanga (?).	Mokaze Oarorosa.
Y.			
You,	Ove, obe,	Goe,	Eoe.
<i>The Numerals.</i>			
1,	Umue,	Mo'keke,	Omoë.
2,	Vevari,	Vaviri,	Vaviri.
3,	Vetatu,	Vatato,	Vatato.
4,	Vauc,	Vane,	Vana.
5,	Vetano,	Macareanja,	Vashana.
6,	Hambohumue,	" Vara'ka,	Vatantato.
7,	Hambombari,	" Varasupi,	Chinomoe.
8,	Hambondato,	Vanjenisa,	Zere.
9,	Omauo,	Varane,	Femba.
10,	Omirongo,	Vakomiki,	Kome.
11,	" na umue	" Vara'ka,	Komina Omae.
	peshi,		
	&c., &c., &c.	&c., &c., &c.	&c., &c., &c.
20,	Omirongo Vivari,	Macareanja Avato-vaviri,	Makome Maviri.
30,	" Vetatu,	Varaka avatovatato,	" Matate.
40,	" Vine,	—	" Maba.
50,	" Vitano.	—	" Mashana.
60,	" Hamboumae	—	" Vatantato.
	&c., &c., &c.	&c., &c., &c.	&c., &c., &c.
100,	Omirongo mirongo,	—	Mazana.

NOTE.—In the Otjherero language, *Oka* placed before the Imperative forms the Infinitive: e. g. *Rinde*, buy, *Okurande*, to buy. The numerals up to five are altered according to the prefixes: *Omaudu umue*, man one; *Ondjoo imue*, house one; *Etari rimue*, cap one; *Otitjuma tinue*, vessel one; *Okati humue*, stick one; *Orauo rimue*, knife one; *Ovanda Vevari*, men two; *Othondjoo tatatu* or *thetatu*, houses three; *Omatarijane*, caps four; *Oetjuma Vitano*, vessels five, &c. The letters B and P are pronounced indiscriminately. In the Chylimanse language R and L are also used indiscriminately.

(^c) This sign in the Bayeye language, when placed between two letters, signifies a soft klick, and an inverted Comma (^c) the hard klick.

I have dwelt at some length on the subject of the Tiogé, the Lake, its rivers, productions, inhabitants, their peculiarities, &c.,

as no connected account in detail of the whole has yet been published. As to the country N. of the Lake, and the river Zouga, the Society must already have received, through the instrumentality of that indefatigable and energetic explorer Dr. Livingston, much more accurate and interesting information than I should be able to furnish. A few words, however, relating to the regions S. of Ngami will, I think, not be altogether out of place. I refer to the *Kalahari Desert*. This vast and apparently useless country extends in a semi-circle from the very banks of the Orange River to the sea on the W., being on the W. and S. bordered by Great Namaqua and Damara-land. Mr. Galton's Kaoko is a part of this desert. The Kalahari has always been described as a sandy desert, devoid of water, and unfit for travelling, having, as is well known, for a long period baffled every attempt to cross it; but thanks to the persevering energy of Europeans, many of the obstacles which at first appeared insurmountable have been successfully overcome, and it is now almost daily traversed by the daring hunter and the enterprising and persevering trader.

The Kalahari is inhabited by numerous Bushmen and Kalahari, the tract of land probably deriving its name from the latter. They are a black nation, speaking the Bichuana language, and though they possess no large cattle, they rear goats in abundance: they moreover cultivate beans, peas, calabashes, pumpkins, and water-melons, extensively. The latter appears to be their chief support, and a failure of the annual crop is frequently followed by famine. In the rainy season water is as abundant in the Kalahari as in any other part of the neighbouring countries; and though, from the nature of the country, it is scarce in the dry season, it is by no means entirely wanting. It is well wooded in many parts, and as regards pasturage may be said to rival the finest prairies of South America. Of wild animals, such as the giraffe, the zebra, the gnu, the springbok, and even the ponderous elephant, which migrates to these regions in the rainy season, there is no want. It is in search of the latter animal that the enterprising Griqua often risks his life. And it is no less frequented by the Bichuanas, who make regular hunting excursions into the Kalahari for the sake of the skins of the "tiger" (leopard and panther), the jackal, &c. The Bichuanas treat the poor timid Kalahari with no more consideration than they do the Bushmen, for they compel them on these occasions to carry the spoils of the chase, provisions, water, &c., unmercifully flogging them should they show the least sign of reluctance. On my return from Lake Ngami I penetrated a few days' journey into the Kalahari, but did not, at the time, meet with any Kalahari Bichuanas. Bushmen, however, were numerous.

I left Lake Ngami only to return to Cape Town to refit, intending in the following spring to follow up my geographical explorations, but on my arrival in Great Namaqua-land, I received letters from my family in Europe of a nature that left me no option but to return without a moment's delay; and as a matter of course all my previous plans and arrangements had to be given up, which, I must confess, was not done without considerable regret. The vessel that annually brings the missionary stores to Walfisch Bay, had already delivered her cargo and returned to the Cape, and no other craft was expected for the next four or five months. As time with me was now valuable, and my stock of provisions nearly exhausted, I deemed it advisable to prosecute my journey by land; and as the part of the country through which I purposed to pass, was but little known to Europeans, I felt anxious to have an opportunity of fixing by astronomical observations some of the chief places. After somewhat more than 30 days of harassing travelling I reached the Great Orange River in safety, but the rains having only partially fallen, both water and pasturage were scarce, and my cattle were in consequence in a dreadfully exhausted (or rather dying) state when we arrived. Fortunately for me a small craft had just arrived at "Alexander" Bay, close to the mouth of the Orange River, in which I succeeded in securing a passage to Cape Town.

To enter into details about my journey through Great Namaqua-land would, I fear, be both tedious and uninteresting; and a short, general account of the country, the inhabitants, their peculiarities, &c., will, I hope, be more to the purpose.

Great Namaqua-land extends from the Orange River on the S. to the Damaras on the N., and to the E. and N.E. is bounded by the Kalahari desert. It may be said to consist of an immense valley, chiefly formed by that peculiar stream the Fish River, and its tributaries, which ultimately joins the Orange River some 3 or 4 days' journey from where the latter finds an outlet into the sea. It is very arid, and during more than half of the year it is scorched by an almost vertical sun. The rains are periodical and very partial; little or none falls about the lower course of the Orange River and the neighbouring districts. The Namaquas are loud in their complaints that less rain falls now in their country than a quarter of a century back; this seems also to be the case in Damara-land. The fountains are also fewer than in the last-mentioned country, and very indifferent; the periodical water-courses are in reality the reservoirs. The Namaquas ascribe their present restlessness and migrations, in a great measure, to the want of the most common necessities of life.

In a geological point of view Great Namaqua-land presents

many interesting features. At some remote period it must have been much subject to volcanic eruptions, and though none has taken place in the memory of the present generation, subterraneous rumbling noises, and tremors of the earth, are of frequent occurrence. On one occasion, whilst the congregation at the missionary station, Rehoboth, was engaged in prayer, a sudden shock shook the church to its very foundation; at the same time a rumbling noise like the distant thunder of cannon was heard.

The sea-face of Great Namaqua-land is precisely similar to that of Damara-land, viz., a strip of desert sand extending some 30 or 40, and sometimes as much as 100 miles inshore, and with a *very few* exceptions, uninhabitable. Two to three days' journey S. of Rehoboth, the dense thorn-coppices, so peculiar to Damara-land, cease, and excepting a few mimosas along the water-courses and individual black ebony trees, the vegetation is scanty and stunted.

Barren as Great Namaqua-land appears to be, it undoubtedly contains a boundless store of mineral wealth; for specimens of copper, iron, tin, lead, &c., are almost everywhere to be met with. I have myself had specimens of copper ore in my possession containing from 50 to 90 per cent. As Great Namaqua-land becomes better known, it is more than probable that it will be found equally, if not more prolific than Little Namaqua-land, where of late such extensive and splendid ores have been brought to light.

The people, who inhabit Great Namaqua-land, are known as Namaquas or Hottentots, and may be divided into two great tribes, the "*Topnaars*" and the "*Oerlams*." By the latter is generally understood the new-comers and the half-civilised, but the real signification of the term is doubtful. Some say it is a nickname given to them by the Dutch colonists, and in that sense it implies a barren ewe—"a creature good neither for breeding nor fattening, a worthless concern, one that gives trouble and yields no profit." Again, and perhaps with more probability, "*Oerlams*" may be a corruption of the Dutch word *Oerland*, or overland, that is, people who have come overland. Be this as it may, however, the Namaqua Hottentots always consider it as a compliment to be addressed as *Oerlams*. "*Topnaars*," on the other hand, signifies the first, the highest, the great, or those who originally inhabited Namaqua-land, and they view with the greatest jealousy the progress of the *Oerlams*, whom they consider as intruders. But all these terms are only technical, for the Bushman, the *Oerlam*, the *Topnaar* are identical. "The Namaqua Hottentot is simply the reclaimed and somewhat civilized Bushman, just as the *Oerlam* represents the same raw material

under a slightly higher degree of polish. Not only are they identical in features and language, but the Hottentot tribes have been, and continue to be, recruited from the Bushmen." During my travels I never met with a single specimen of the very smallest tribe of Bushmen, that is N. of the Orange River, but travellers tell me that they are by no means uncommon towards the East.

The Namaqua Hottentot, who in a moral point of view certainly stands very low, is not altogether destitute of notions of a Supreme being, for he prays to *Heitjibib* or *Heitjekobib*, whose spirit is supposed to exist in all graves, to bless him with an abundance of the good things of this life, to make him prosperous in his undertakings, &c. No Namaqua will pass a burial-place without invoking a blessing from the Deity. The Damaras, again, worship *Omukuru*, and appear, moreover, to have some indistinct idea of a future state, for they not unfrequently bring provisions, &c., to deceased people's graves, inviting them to eat and to make merry.

The Namaquas have great faith in sorcery, and individuals who deal in this art (they are of both sexes) are called witch doctors, and are held in great respect, and unbounded confidence is placed in their advice and prescriptions. To become a witch doctor of any importance, it is necessary to be instructed by some one previously well versed in the art; and to enable a person to effect cures of poisonous bites of insects, snakes, &c., the novice must begin his operations with swallowing animal poison, by being bitten by some poisonous reptile, &c., or by having poison "cut" into his body. A cap, a handkerchief, or in short any article of clothing worn by a witch doctor, till it has become thoroughly saturated with filth, is considered as the most effectual remedy for curing diseases, poisonous bites, &c. One of these inestimable treasures is always kept in reserve, and in cases of emergency a small corner is carefully washed, and the dirty water thus produced is given to the patient—be it man or beast—to drink! "Undoubtedly," as Sir J. Alexander remarks, "a sickening dose."

The ceremonies attached to marriages are few and simple. If the father of the woman whom a man is desirous of marrying, is favourable to the match, the matter may be considered as settled. On the occasion of a betrothal, an ox or cow is killed at the door of the *bride's* dwelling. According to their usages, a man may keep as many wives as he chooses or can afford, but since missionaries have settled amongst them, this abuse is in some degree done away with. No provision is made for widows, who are left to shift for themselves. Children are easily reared, and without cradling. They have no circumcision, but the Damaras have.

The Namaquas may be said to be long-lived, for persons are

known to reach the advanced age of *ninety*, and even *one hundred*, years! And this is perhaps the more remarkable, when the very wretched and miserable life that they lead, is taken into consideration. On the death of a person, some of his cattle—the richer the deceased is, the more numerous are the animals slaughtered—are killed, and a feast given in honour of the occasion. The beasts are then killed by suffocation, whilst under ordinary circumstances they are despatched by some sharp instrument.

The Namaquas are excessively dirty and filthy in their habits, though, at the same time, they delight in ornaments and finery. I have often been amused to observe one of these half civilized creatures dressed in a first-rate suit of black cloth, with a shirt perfectly black with dirt protruding from beneath another of the purest whiteness. Small beads of divers colours are highly prized by them, which they not unfrequently work into patterns of considerable taste and beauty.

Not very long ago, the barbarous custom of leaving old and infirm people to their fate, that is, either to die from hunger or to be devoured by wild animals, prevailed; but the influence of Christianity has already considerably ameliorated their cruel and rude manners.

It was formerly customary in Great Namaqua-land, on the death of a chief, to call the whole tribe together to consult upon the affairs of the country. Great numbers of cattle were then killed, and all the best and choice parts of the animals were set apart for the son of the deceased, who was to succeed his father in the chieftainship. Again, after a great hunt had taken place, the best parts of the "bagged" game were preserved for the chief, and the remainder divided equally amongst the tribe. At the present day the authority and sacredness of the chief have dwindled down to a mere shadow, and his power is only nominal. This is of course a great drawback to the prosperity of the country.

The Namaquas are fond of indulging in intoxicating liquors whenever they have an opportunity. By a most simple process they are at one time of the year enabled to supply themselves with this luxury. From the different species of juicy berries, indigenous to the country, they distil a sort of brandy which, when used in any quantity, has the most appalling and maddening effect upon the brain. When in a state of intoxication from this drink, brothers have been known to stab each other, and parents to have killed their only child! Besides spirits, the Namaquas prepare from honey, obtained from the wild bee, a very harmless, cooling, and agreeable beverage.

TABLE of Latitudes, Variation of the Compass, Height of Places above the Level of the Sea.

Places of Observations.	Number of Observations.		Mean Latitude.			Variation of the Compass (West of North).			Heights in English Feet above the Sea.
	N.	S.	"	"	"	"	"	"	Feet.
Walflsch Bay									
Scheppmansdorp									
Oosop	1	1	22	45	25				
Tineas River .. .. .	..	1	22	50	36				
Halfway between Onanis and "Wit"-water .. .. .	..	1	22	47	14				
"Wit"-water	1	1	22	41	48				
Tjolis Fountain	1	1	22	30	40				
* Otjimbingué .. .. .	..	1	22	21	24				
8 Barmen .. .. .	..	..	22	7	0	..			4324
Six hours' ride (southward) of Barmen Station .. .. .	..	1	22	13	24				
8 Fikhas .. .. .	..	..	22	34	35				
8 Rehoboth	3	1	23	18	43	30	0	0	5350
Otjomatanga .. .. .	..	..	..	..	..	..			5189
On road to Amral from Rehoboth	4	2	23	8	3	29	30	0	
On the bank of White Nosop	1	2	23	0	49				
On road between Black and White Nosop River)	..	1	22	65	29	27	0	0	
Ditto ditto	1	1	22	42	17				
Vley between Black Nosop River and Twas .. .. .	..	..	22	41	42				
Twas .. .. .	..	3	22	36	31				
Between Twas and Korighas .. .. .	..	1	22	32	22				
Ditto (on a small river) .. .. .	..	1	22	24	22				
Korighas .. .. .	..	2	22	15	36				
Between Korighas and Elephant Kloof .. .. .	..	2	22	15	28				
Elephant Kloof	1	2	22	11	42	27	0	0	
Tunobis or Otchombländ	1	3	21	54	57	27	0	0	
Between Tunobis and well on the Tunobis River	1	2	21	54	57				
Well on Tunobis River .. .. .	..	2	20	50	45				
Ghanzé	1	1	21	34	15	26	30	0	
Abeghan .. .. .	..	..	..	..	..
Kobis .. .. .	..	..	..	..	..				3706
Vley "under Koppy" .. .. .	..	..	..	..	..				3879
Lake Ngami (north side)	1	..	20	23	15	26	0	0	
Ditto ditto (but more to the westward)	2	..	20	27	52				
Ditto (south side) .. .. .	..	..	..	..	..	..			3713
Near the mouth of Tiogé	1	..	20	24	52				
Tiogé River	3	..	20	20	52				
Ditto	2	1	19	56	53				
Omoroanga Vavarra	1	..	19	46	57				

* 8 = Missionary station.

Table of Latitudes, &c.—*continued.*

Places of Observations.	Number of Observations.		Mean Latitude.			Variation of the Compass (West of North).			Heights in English Feet above the Sea.
	N.	S.	"	"	"	"	"	"	
Tioge River	2	..	19	34	46				
Ditto	1	..	19	38	49				
On the bank of the White Nosop River .. .. .	..	1	23	2	34				
♀ Hoachannas	2	2	23	56	35	28	45	0	
The "Port" (south of Rehoboth)	1	..	23	51	31				
On Small River	1	1	24	8	5				
Kam River	1	1	24	14	51				
Oosip River	1	1	24	25	7				
Araka-Oop, or Blomfish River	1	..	24	32	16				
Houtton River	1	..	24	46	1	29	30	0	
Aamhoup River	2	..	25	19	29	29	30	0	4480
Near Qas River	1	..	25	54	48				
On the Koanquip River ..	1	..	26	3	33	30	0	0	
♂ Bethany	2	..	26	29	4	30	0	0	3945
Knikoap	1	..	27	6	10				
Half an hour from Kai-koap	1	..	27	6	34				
About 7 hours southward of Knikoap	1	..	27	21	19				
Hoon's Fountain .. .. .	..	..	27	25	1				
Kloof Outspanplace	1	..	27	37	12				
Close to "Brackboot" ..	1	..	27	41	2				
Halfway between Kaidaus and Brackboot	1	..	27	37	12				
Kaidaus .. .. .	..	..	27	39	69				
Between Kaidaus and Orange River	1	..	27	56	49				
Missionary Drift	2	1	28	8	38				
Kodas Copper-mine	2	1	28	14	48				
Annis Fountain	1	..	28	23	49				
Mr. McDougall's house, near the mouth of Orange River	1	..	28	35	19				
Alexander Bay	1	..	28	40	0				

NOTE.—The above observations on the variation of the compass have been deduced from bearings taken by a very excellent Azimuth Compass, tested before starting by the Royal Astronomer at the Cape, Mr. Maclear. But notwithstanding this, and the habit of taking E. and W. observations, in order to insure accuracy, it is possible that, from the very magnetic character of the country, errors may have occurred.

III.—*Brief Summary of an Exploring Trip up the Rivers Kwòra and Chàdda (or Benué) in 1854.* By WM. BALFOUR BAIRIE, M.D., R.N., F.R.G.S., F.S.A. Scot.

Communicated by the EARL of CLARENDON.

Read, 26th February, 1855.

HAVING been so fortunate as to have been appointed medical officer and naturalist to an expedition intended for the exploration of the rivers Kwòra and Chàdda, I left Plymouth on the 24th of May, 1854, by the African mail steamer 'Forerunner,' and having visited during the voyage all the usual ports, and entered the mouths of the chief trading rivers in the Bights, reached Fernando Po about the end of June. Here, to my equal surprise and regret, I heard confirmed the sad rumour which had already reached me, of the death of the experienced traveller and navigator who had been nominated as chief of our party. Regret, I say, on account of the great public as well as private loss caused by his decease; and astonishment, because Captain Beecroft was one of those hardy individuals who, having braved alike the polar frost and the equinoctial rays, and having passed unscathed through trials experienced but by few, was looked on as more than usually exempt from the ravages of time, and whose sudden death was unlooked for. For many years the summit of his ambition had been to lead an expedition into Central Africa, and now, alas! when the long-desired prize was almost within his grasp, it was thus suddenly snatched from him.*

As officer next in seniority, I considered that, as the preparations for the voyage were so far advanced, and the expectations of all interested in its progress were raised, it was a matter of duty to make an attempt, more especially as one of the objects was to communicate with the Central African Mission of Barth and Vogel, who possibly might stand in need of aid. My anxiety was, however, greatly lessened by an officer of H.M.S. 'Crane,' Mr. D. J. May, volunteering to accompany me, as I felt that, from the character he had already acquired in the navy, and from his acquaintance with the scientific branches of his profession, and his proficiency in nautical astronomy, he would prove of infinite service. The permission of his commanding officer, Commander T. Miller, having been readily obtained, I waited impatiently during the final equipment of the 'Pleiad,' a work which occupied ten days. At Fernando Po, I was obliged to invalid and send home Dr. Phil. W. Bleek, who had been sent out as ethnologist; his constitution being evidently unfit for a tropical African

* See President's Address, p. lxxxiv.—Ed.



climate, and his health having, even by that time, suffered severely.*

Before entering upon the narrative of the voyage, it may prove convenient if I summarily state the principal results obtained.

1st. We have explored about 250 miles of the river Chádda beyond the farthest point reached by Allen and Oldfield in 1833, and having arrived at within 50 miles of the meeting of the Fáro and Bínne, have established the identity of the Chádda with the Bínne.

2nd. We have ascertained the navigable nature of the river during the rainy season, up to our farthest point, and, seemingly, as well as from the information of the natives, considerably beyond.

3rd. We have encountered several new tribes, have inquired into the resources of the countries, and proved the friendly disposition of the natives.

4th. From numerous careful observations, we have been induced to lay down positions for various places differing from those given in late maps; our farthest point E. being about $11^{\circ} 30'$, at which time we were considerably beyond Hamarúwa, and within about 50 miles of the confluence of the Fáro, placed by Dr. Barth in 14° E.†

5th. We shall be able to construct a tolerably accurate chart of our entire course, and can show the observations on which our positions are based; we have also collected materials for an improved map of the surrounding countries.

6th. We can offer a considerable amount of information regarding the new countries, and also numerous additional facts concerning the countries previously known, especially Igbo.

7th. We have ascertained more correctly the periods of rise and fall of the water, differing somewhat from previous accounts, and are able to indicate the proper times for entry and descent.

8th. With the assistance of the Rev. S. Crowther, we have satisfied ourselves of the general desire of the natives to receive instruction, and to admit teachers, and of their wish to trade with us.

9th. We have inquired into the extent of slavery, either domestic or otherwise, and

10th. We are enabled to report favourably of the climate, having encountered but little sickness, and not having lost a single life.

We left Fernando Po on the 8th July, with an abundant supply of coals on board, and after a tedious and uncomfortable passage of four days, arrived off the mouth of the Nún

* For the origin and organization of this expedition, see the President's Address to the Society, Vol. 24, p. xcv.

† The alterations we have made in longitude along the Upper Bínne correspond very closely with those of Dr. Vogel and the Sappers and Miners at Lake Chád.

branch on the 12th, and, immediately crossing the bar through a heavy sea, entered the river. The weather both at this time and on our return in November being cloudy, and very unfavourable for making observations, we adopted Captain Denham's positions for the mouth (1846), by which Palm Point, the eastern point, is placed in lat. $4^{\circ} 16' 10''$ N., and long. $6^{\circ} 4' 35''$ E.* A slight accident having happened to one of our safety-valves, we had to anchor, and accordingly chose a position well removed from either shore, and fully exposed to a fresh sea-breeze, which, at that season, blew continuously. During the two days of our detention here, Mr. May and I explored in our gig several of the numerous channels on the W. side of the Alburka islands, and from the strong currents we met, and the great depth of water, 5 to 8 fathoms, we conjecture that a better and more convenient passage exists in that direction than by the narrow channel on the E. side known as Louis Creek. We passed a large stream flowing about S.S.W., which we believed to be the Sengana branch. When we commenced our ascent on the morning of the 15th, finding a shallow bar across the mouth of Louis Creek, our pilot took us by another passage, of which the entrance only appears in the previous charts, and which we named after him Richards Creek. A very few miles above Sunday Island, huts and plantations became numerous along the banks, and shortly afterwards villages, at first small, but gradually increasing in extent.

The district from the sea, up as far as the mouth of the Wari branch, is named Orù, but is known by some neighbouring tribes as Ejó, which name is also employed in the parts of this country towards the Rió Formosa. The people are very distinctive in their appearance, marks, language, and manners, and, from their treacherous nature, are the only persons to be guarded against in the whole river as far as we went. Among them are the Bassa people, supposed to have been concerned in the murder of Mr. Carr; the Wari tribe, visited by Mr. Beecroft, and well known to the Benin palm-oil traders; but, as far as I can learn, the most savage among them are those living near the mouths of the different rivers between the Nún and the Rio Formosa. Their largest town near the Kwèra is Angiáma, where Lander received his mortal wound. Their farthest village up is named Agbéri, in lat. $5^{\circ} 14' 41''$ N. I communicated with the people freely, and without any difficulty, and tried to point out how much more beneficial it would be for them to cultivate trade than war. Much palm-oil is produced here, which is carried by canoes through the creeks to the Brass and New Kalabar rivers.

Behind Orú are the Brass people, also wild and rude, speaking

* By Allen, in 1839, this point was placed in lat. $4^{\circ} 20'$ N., and in long. $5^{\circ} 55'$ E.

a kindred dialect, but using a different mark. They call themselves Nínbe, which is also the name of their chief town, situated about 35 miles from the sea; the village marked as "Brass-town" in the charts is properly named Tuvón.

After leaving Orú we reach I'bo, or more correctly I'gbo, an extensive and very important territory, extending from the banks of the Kwèra to the Old Kalabar river. It is divided into numerous districts, most of which speak different dialects, the one with which Europeans are most familiar being Abó, the "Eboe" of Allen and Lander. Here let me notice a conjecture of Koelle in his '*Polyglotta Africana*,' namely, that I'bo is a name unknown to the natives, until they learn it from white men. This is quite erroneous, as the name I'bo or I'gbo is as familiarly employed among the natives as London is among ourselves. The word is correctly spelt I'gbo, the *b* being always hard, while in some places the *g* is distinctly sounded. We of course visited Abó, and were hospitably received by the sons of the late King Obi. Since the death of this king, which took place in 1845, there has been a kind of interregnum. The succession to the throne is chiefly elective, and, though most are in favour of Obi's second son, named Ajé, still he cannot be actually established until he pays certain sums of money, which are as yet only partially settled. He is, notwithstanding, looked on as the most important person there, and from his active, energetic habits, and determined disposition, is well suited to rule over them. His elder brother, Tshúkuma or Okúrobi, is quiet and unambitious, and makes no pretension to regal dignity. We place Abó in lat. $5^{\circ} 31' 16''$ N., being about 8 miles farther S. than it is situated in Allen's chart.

Compared with former accounts, the habits of this people are improving, and their feeling towards white men is decidedly good. The largest district in I'gbo is called Isuáma, and the dialect spoken here being the simplest and the least harsh, it may be assumed as the standard. The religion is entirely pagan, the worship being chiefly of Fetish objects. Their name for the Deity is Tsùku, and in the E. of I'gbo is a large town named A'ro, where exist a celebrated shrine and oracle, to which numerous pilgrimages are made. Among other important I'gbo towns which I visited, were Ossamaré, Onitshá, and Asabá, all along the river, the latter being on the right bank in lat. $6^{\circ} 11' 16''$ N. The river is by the Abó people named Oshínini, or the "great water," and by some other I'gbo tribes "Anyím."

Beyond I'gbo, on the left bank, is the country of Igára, of which the capital is Iddá, in lat. $7^{\circ} 6' 2''$ N., and long. $6^{\circ} 42' 14''$ E. The inhabitants are somewhat more civilised than those of I'gbo. Their language somewhat approaches the Yoruba, and they employ no national mark. We visited the king, who is styled Attá

or Father, and were received with much barbaric pomp. The people are very friendly, but this state, once very powerful, is now gradually dwindling away.

On the W. side of the river the country opposite Iddá is named Edó or Adó, and is tributary to Benin. A little farther N. is a tribe named "I'gbira-Shima," to distinguish them from another I'gbira tribe, to be mentioned presently; still farther northward is Kakánda or Bássa.

From various causes we did not reach the confluence until the 4th of August, and there we remained for two days. The ground formerly occupied by the model-farm is now entirely overgrown, and the ruins of the once celebrated market-town of Odokódo are hardly to be discovered among the thick brushwood which covers its site. On the left bank stands a very busy and important town named Igbégbe, admirably placed, and the seat of a large and increasing trade. The king, who showed himself throughout as our warm friend, is eldest son of that A'boko who so befriended Laird, Lander, and Oldfield at Iddá, and he seems to have inherited all his father's predilections for white men. Though situated in the country of Igára, the inhabitants are mostly I'gbira, and are one of the most civil, industrious, and trading people we met with. A large market is held here every fourth day, which is attended by people from all directions. The situation of Igbégbe is in lat. $7^{\circ} 44' 33''$ N., and long. $6^{\circ} 44' 27''$ E.

From our anchorage at the confluence, near the Sacrifice rock, as well as from the heights of Mount Pátte, the Chàdda appeared a much nobler and finer stream than the Kwòra. The latter seemed small and narrow, and could be seen pursuing in the distance its meandering route from the northward, while full in front comes pouring from the E. the broad, the straight-coursed Chàdda. The natives allege that there is a difference in the colour of the two streams, and hence the Kwòra is named in Haússa Fari 'n rua, or the "White Water," while the other is known as Baki 'n rua, or the "Black Water." I found the temperature of the former to exceed that of the latter, by from half a degree to a degree of Fahrenheit.

For about 60 miles from the confluence, along the N. bank of the Chàdda, the country is named I'gbira, and the inhabitants, to distinguish them from a tribe already alluded to, are known as I'gbira-Panda, or I'gbira-Ihì. Their character I have already noticed, and their language is very much allied to the Yoruba. Their chief town is Panda, the Fundah of Laird and Oldfield's narrative, and the Fándah of Allen's chart, the letter "F" being a Haússa corruption for "P." Just before our arrival, Panda had been attacked by a Filáta band from Zaríá, who had sacked the place, killed the king, and driven off the inhabitants. All along the

banks we met numbers of these poor people thus expelled from their homes, many of whom crossed to the S. side of the river, and commenced forming fresh settlements. Their principal remaining town is Yimahá, along the river in lat. $7^{\circ} 59' 14''$ N. and long. $7^{\circ} 9' 47''$ E., where, on our return voyage, we found them more settled, and again resuming their industrial employments. The new king is an intelligent, active man, about 35 years of age, and is a Mahomedan. They were then endeavouring to ransom such of their friends as had been carried captive, and as their means were becoming exhausted, I sent them four bags of cowries (80,000) to assist them. It was quite a treat to visit one of their towns, and see at least three-fourths of the population actively engaged. Many were busy buying and selling in the market, corn, yams, fufu, beer, dried fish, rice, salt, palm-oil, shea-butter, cotton, mats, grass-cloths, &c. At the doors of the huts were seated women picking cotton; cloth-weaving was a common occupation. Every town had a larger or smaller dye-work, generally two or three country-beer breweries, and in some a blacksmith might be seen blowing his charcoal fire with a primitive kind of bellows, or producing with rude tools very fair workmanship.

Along the left bank of the Chàdda, for nearly 80 miles, the country belongs to Ígára, but retains its original name of A'kpoto. On the right bank, adjoining I'gbira, is a smaller territory, named Bássa, the inhabitants of which have very dark skins, and speak a language having affinities both with the Ígbira and the Núpe. The next country to this is Dóma, near the commencement of which is the town of Dágbo, the farthest point reached by Allen and Oldfield in 1833.

Hitherto I have said little or nothing of the appearance of the country, that being recorded in the published accounts of various preceding travellers; but from this point the localities are new. The extreme breadth of the river here, we could not easily ascertain, on account of a large wooded island lying in the centre, but it must have exceeded a mile. A group of large islands extends hereabouts for nearly 20 miles, which I named the "Admiralty Archipelago." The country above this was rather low near the river, but, on either side, at a distance of 3 to 10 or 12 miles, was a range of low, rounded hills, generally from 200 to 500 or 600 feet in height. The first town of consequence we reached was on the north bank; it was named A'kpoko, and was prettily situated at the foot of the Dóma hills, a small range seemingly of unstratified rock, the highest peak of which I named "Mount Allen," being of an elevation of from 500 to 600 feet. We here met with a very cordial reception, and the people immediately opened a trade with us. The position of A'kpoko is in lat. $7^{\circ} 55' 34''$ N. and long. $8^{\circ} 5' 22 \cdot 5''$ E. Beyond this, the navigation was rather intricate

and difficult, but by the 23rd August we reached another Dóma town, named "O'jogo," where I heard a most interesting report, which caused me to remain for several days. Immediately after our arrival, a native informed us that about six or seven weeks previously he had seen at a town named Keána, distant from O'jogo about four days' journey, two white men who had been visiting the king. I questioned him several times, and in different ways, and finding that he never varied in his story, determined instantly to send off messengers. These ascertained that the travellers, whoever they were, had departed from Keána 47 days previous to our arrival, had thence proceeded to the town of Dóma, which they had left after a three days' stay, and then had gone again towards the interior. I showed the man the frontispiece to Petermann's atlas, on which he, at once, selected the portrait of Dr. Barth, remarking, however, that the beard was wanting. From this I was led to conjecture that one of the white men was Dr. Barth, a supposition which subsequent information has shown to be erroneous. Our detention at O'jogo was, nevertheless, turned to good account. It enabled us to study more closely the people of Dóma. Mr. Crowther had time to make out a tolerable vocabulary; the chronometers were fresh rated, and Mr. May got good latitudes, and was enabled to fix the position of the place with considerable accuracy, viz. in lat. $7^{\circ} 45' 8''$ N. and in long. $8^{\circ} 28' 31''$ E. It also permitted us to become acquainted with a new and very peculiar tribe, named "Mítshi," whose territory commenced on the left bank, just below our anchorage. They were a wild, suspicious race, curiously tattooed, and speaking a language of their own. My first attempt to visit them was made at a rather unfortunate moment. A serious disturbance had just arisen at one of their market places, and, as we approached in our gig, we found numbers of people leaving hastily in their canoes. The Mítshis seemed to think we had come to take part in the quarrel, and immediately assembling armed, in considerable numbers, on the top of the bank, forbade our landing. I tried to parley with them, and showed them some presents I had with me, but this had no effect; they placed their poisoned arrows in their bows, presented their spears, and drew their swords. I had no arms in the boat, and if I had, it would have been most impolitic to have employed them, so I determined to wait for another opportunity. This presented itself ere long, and before a week had passed, the very chief who had so opposed our approach came to visit us on board the 'Pleiad.' Farther up the river I met with others of this singular race, and learnt more of their habits and language.

From the date of our entry into the river up to this time, the river had either been stationary, or falling after the early rains; but while we were at O'jogo the latter rains commenced with their

usual accompaniments of tornados, and, before we were ready to leave, the water had risen 6 feet, which greatly facilitated our farther progress. After O'jogo, the next town of importance we reached was one on the right bank, named Rógan-Kóto, which, though in Dóma, is an Igbira settlement, whence its name, Kóto being the Haússa synonyme of Igbira, and Rógan meaning huts or sheds. On an island near this was a town named A'kpa, colonized from Korórofa; and being the first place where this people are met, it has given them a name, as, among tribes to the westward, Korórofa and its inhabitants are known as A'kpa, and under this designation I since found some individuals living at Sierra Leone. Farther to the eastward, on a large island, which was named "Clarendon Island," stands another large trading town, named Abítshi, inhabited chiefly by Korórofa and Igbira people. Close to this is another large island with a good channel on either side; this I named "Washington Island." Passing these places, we observed to the northward of the river the peaks of two rather low, but distinct hills, seen, on account of the flatness of the country to the westward of them, at a considerable distance. The highest, rising to about 500 feet, and which has a peculiar cleft peak, I named "Mount Beccroft," and the other one "Mount Ethiopé." From this, hills and high lands became more frequent than before, and one range of hills, running E. and W., approached the river. This was named the "Ellesmere Range," the central peak being Mount Egerton, and two others Mounts Latham and Christison.* On the opposite or south side of the river, the bank rises here to about 70 or 80 feet above high-water line, and is composed of primary blocks, altered by subsequent igneous action. On the top of this bank stands a small, recent village, named A'nyashi, which is at present the most convenient starting-point for Wukári.

On the 6th of September we anchored off a considerable town on the left bank, where, on our landing, the inhabitants came down in numbers, armed, and in such a threatening manner as to cause our boat's crew to retreat very speedily; but, on Mr. May and myself with Mr. Crowther and Dr. Hutchinson walking quietly on, and offering to shake hands with them, they became friendly, and conducted us to their king, who, surrounded by the greater part of his subjects, received us in the open air with much cordiality. We found that we were now well in the Korórofa country, but that this and some adjoining villages were Filáta settlements. From this place, which was named "Gándiko," we advanced by the river to another still larger Filáta town, named Zhibú, the principal one in the district, and where we met with a

* The native names should in all cases, if possible, be given.—Ed.

similar welcome reception. This latter town is situated in lat. $8^{\circ} 18' 32''$ N. and long. $9^{\circ} 56' 17''$ E. I left Zhibú on the 10th September with a good supply of firewood on board, and for the two following days made good progress, but could discover no signs of villages. On the afternoon of the 12th, we anchored to cut wood, and continued so employed all next day. On the 14th we were again under steam, but, about mid-day, seeing a good-looking dry tree, determined to secure it, and as the water allowed, we hauled alongside the bank, and got all hands on shore. At night, while Mr. May was ashore taking observations, he was obliged to make a rather hurried retreat, from hearing the growl of a leopard in the thick bush close to him. We again proceeded on the morning of the 16th, having received from a passing canoe the cheering news that we were now leaving Korórofa and entering Hamarúwa. Our firewood being far from dry, was badly calculated for keeping up a good supply of steam, so our progress was slow. At this time I became considerably indisposed, and though I kept on deck, could not attend to matters, but fortunately I had a most willing and able substitute in Mr. May. On the 18th Sept. we reached a small village, named Zhírú, subject to Hamarúwa, but inhabited chiefly by Aborigines. For the four following days, from the bad quality of the fuel and the great strength of the current, we made but little headway. Large branches of dry wood frequently floated past, and which, whenever we could, we secured, but from the rapidity of the stream it was no easy matter. On the 19th Mr. May was laid up with a slight attack of fever, but, by this time, I was able to resume duty.

On the morning of the 22nd I reached the village of Gúrowa, where I found a deputation from the Sultan of Hamarúwa waiting to welcome us, and asking me to send a messenger to him. The town was represented as some 7 or 8 miles from the river, so I desired Mr. Richards to go, giving him a present to carry to the Sultan. Mr. Crowther very kindly volunteered to accompany him, so, escorted by the Hamarúwa party, they at once proceeded. Heavy rains were frequently falling, and the river continuing to rise.

During their absence I learned that the province of Hamarúwa, which is one of the dependencies of Sokatú, is of considerable extent and importance, being but little inferior to Adamawa. It is situated on both sides of the Chádda, here named Binue, the larger portion being on the northern side. The country here had a more decidedly mountainous appearance than any we had yet seen. One long range on the northern side was named the Múri range, and on the southern side were the Fumbina mountains; those peaks which we could see along the horizon being in Adamáwa. The Aborigines were a wild-looking, barbarous people,

named "Bâibai," speaking generally the Djûku language, but the country had been mostly subjugated by the Filâtas. We were now completely in Pûlo* territory, and with these people were invariably on the most friendly terms; they were by far the most intelligent and civilized of any of the races we met with during our wanderings. From good observations the position of Gûrowa was determined to be in lat. $9^{\circ} 8' 36''$ N., and long. $11^{\circ} 0' 37''$ E.

We waited anxiously all next day for the return of Mr. Crowther and Mr. Richards, but they did not make their appearance till the morning of Sunday the 24th, when they came on board tired and footsore, having had a long journey over a miserable road. They had, however, met with a most hospitable reception, and were the bearers of a letter (in Arabic) to me, requesting me to visit the Sultan. As no time was to be lost I made instant preparations, and at mid-day left, accompanied by two of the officers of the 'Pleiad.'

We went by boat down a broad creek for about 3 miles, and then landing, proceeded on foot along a narrow road, or rather track, only wide enough for single file, and enclosed mostly on either side by thick bush or tall grass. Walking was certainly very bad, as great part was completely under water, and the remainder was soft adhesive mud. Our route lay across a level swampy plain, on the farther side of which was a fine rising ground at the foot of a range of hills, and on this eminence the town was situated. We reached it just after sunset, having walked according to my pedometer 14 miles, nearly N.N.W. from the little village of Wûzu, where we landed. We were conducted to the house of the geladîma or prime minister, where a large hut and a surrounding yard were set apart for our use. As it was dark we lit our lantern, and spreading our mats, sat down. We first received a message of congratulation from the Sultan, and immediately afterwards crowds of visitors poured in to welcome us. Half an hour of incessant shaking of hands tolerably tired us, and besides feeling rather hungry after our walk, we were agreeably surprised by the appearance of various dishes, sent us by the Sultan, consisting of messes of milk and of fufu and palaver sauce, two well-known country preparations. Our supper being finished we arranged our couches and slept in the open air, as being freer from mosquitoes than in the hut.

About 11 o'clock next forenoon we were conducted to the Sultan's residence, and were ushered into his presence. We were placed on Turkey rugs but separated from his majesty by a party-coloured silk screen or curtain, which hung from side to side of the apartment, and during the whole interview the Sultan re-

* i.e. 'Pûlo' or 'Filâta.'

mained unseen by us. As soon as we were seated an attendant threw over me and over each of my two companions fine Haússa tobes, and I was presented with a bundle of spears and a basket of Gura (Kola) nuts. The Sultan then expressed his high satisfaction and delight that white men should have visited Hamarúwa during his reign, assuring us of his ardent wish to cultivate our friendship, and saying that he should despatch a special messenger to his master the Sultan at Sokatú to announce our arrival. I then told him of our country and of our Queen, of the objects and intentions of our voyage, of our wish for friendship and for trade, and of our dislike to war, especially when aggressive and unprovoked. I then gave him the presents I had brought for him, which seemed to please him much, and proceeded to take our farewell. He pressed me much to extend our stay, and added that he had ordered two bullocks to be caught for me. I thanked him, but excusing ourselves on account of the lateness of the season, and pressing occupation on board, departed. The language of this town is the Filáta, but all the traders also speak Haússa.

It was now past 1 o'clock, so, hurrying back to our hut, I got our baggage packed up and at once despatched the Krúboys. One horse was brought, on which Mr. Guthrie mounted, and two others were promised us, but as they were delayed I walked on, leaving Dr. Hutchinson to follow with the steeds. I soon came to a very wet part of the road, where the easiest method of walking was barefoot; but not having a guide, I wandered along a wrong track, and by sunset had completely lost my way, having nothing around me but thick bush. I therefore looked out for a good tree as the best quarters I could take up, and fortunately found a large Monkey breadfruit-tree, up which I climbed, and seating myself about 15 feet from the ground, spent a not uncomfortable night, though the howling of leopards and other wild beasts awoke me several times, and did not cease entirely till daylight. In the morning I luckily found a few huts, and getting a guide, proceeded towards the river, meeting after a time with a party searching for me, but who had already consigned me in their imaginations to the wild beasts which abound in this district.

From several causes I was most reluctantly obliged to give up the idea of proceeding farther in the ship, but Mr. May and I determined to make the attempt in our gig, and so, with a crew of six men, we left at daybreak of the 27th September, the river still rising. For some days previously there had been invariably a fresh breeze blowing up the river, but this day, to our great disappointment, it was nearly calm, and we made but little progress against the current. We visited two villages belonging to Hamarúwa, named Chómo and Làu, in both of which the aboriginal inhabitants, though friendly, were less civilized than any we had

hitherto met. Next morning, having a slight breeze, we did rather better, and in the afternoon reached a large village named Djin, situated up a swampy creek, where, on leaving, an attempt was made to detain us. Near this, however, we fortunately found a piece of dry ground on which we landed for observations. On the third morning we had a fine breeze and went rapidly up, and early in the forenoon arrived at a village named Dùiti, now, by the rise of the water, most completely inundated, and in which, except around the foot of one tree, there was not a single spot of dry ground. To this spot we waded to get observations, but were soon surrounded by crowds of most savage, wild-looking barbarians, who, both male and female, were equally destitute of clothing. For some time their surprise kept them quiet, and we tried to keep them in good humour and to get into conversation with them, but they soon began to be troublesome, and in a body advanced to seize and pilfer our boat, when a little pet terrier I had with me raised her head, on which in astonishment they all held back. Not wishing to have any quarrel, and their numbers, from 300 to 400, all armed with swords, spears, and bows with poisoned arrows, being rather out of proportion, I judged it advisable to remove, so giving one or two presents to the head men we suddenly shoved off. While searching for another landing-place near, to complete our observations, their canoes followed us and tried to entangle us among the bushes, so we had to retreat rapidly to the open river, where we were in safety, as if the canoes annoyed us we could at once have run into them and upset them. On reaching the open water their canoes, 9 or 10 in number, each with 8 or 9 armed men, immediately turned back. Our Krùboys were in a great fright, so that in everything Mr. May and I had only ourselves to depend on. We had previously fixed the afternoon of this day for our return, and so had, though very unwillingly, to steer down the river.

This, our extreme point eastward, is, as nearly as we could determine, in lat. $9^{\circ} 25' N.$, and long. $11^{\circ} 30' E.$ From the information we received, we believe that we were not then more than 50 miles from the Faro, and it was a matter of deep regret to us that we did not reach that confluence. Had the wind blown as freshly for the first two days as it did during the third, we might, without much difficulty, have attained that point.

During our return, which was much more speedy than our ascent, we continued to complete our survey, getting soundings and outlining the river's banks. By dark we had gone about 24 miles, when, being unable to continue our operations, we anchored. About 1 A.M. on the 30th, one of the heaviest thunder-storms I ever witnessed came on, and for upwards of two hours the whole sky was one entire and continuous blaze of most vivid light.

About 9 A.M. we reached Gùrowa, where we found that the 'Pleid,' owing to some temporary false alarm, had left two days previously. We followed, and, as the current ran strong, went rapidly along. Towards evening we entered a wrong creek, and soon found ourselves in submerged country; and it was not till 9 next morning that we regained the river, having pulled over fully 20 miles of flooded land. This forenoon we overtook the 'Pleid,' aground on the weather end of a bank, having gone about 120 miles in our gig. By considerable exertions the ship was floated on the afternoon of the 2nd of October, and on the morning of the 3rd, having no fuel on board, dropped down the river about 20 miles to Zhibú, where we remained for some days to re-rate the chronometers and to cut wood.

During our descent we touched at many towns and villages, and wherever practicable repeated and tested the observations made during the ascent, and by the 18th of October Mr. May was enabled to get the sun's meridian altitude, the angle previously having been too great to be measured by the sextant. On the morning of the 20th of October we once more reached the confluence, and anchoring off Igbégbe, remained for 5 days, during which time fresh chronometer rates were once more obtained. The only incident I have to mention is, that a man whom I had taken from this place as a guide and interpreter, and whom I left at Ojogo, brought on board with him, when we called to re-embark him, a boy, whom he confessed, after much questioning, to be a slave for sale. I told him that our vessel could not be considered as a slave-ship, and that I should take and free the boy, but as he might have erred in ignorance, I should pay him his market value, viz., 50,000 cowries, or from 7*l.* to 8*l.* He agreed very gladly, but on reaching Igbégbe tried to kidnap the boy; on which I had him sent for before the king, to whom I related the whole circumstance, ending by telling him and the people around our views on the slave trade. Before leaving I ascertained that my ransoming the boy had given much general satisfaction, and it showed the natives that, although no one was wronged, we are opposed to slavery in deed as well as in word. The boy, whose native name is Gato, is of the Mítshi tribe; he is a smart, intelligent youth, and under the English name of William Carlin is now at school in Sierra Leone.

Of the remainder of our voyage I have little to say. We crossed the bar under most favourable circumstances on the morning of the 6th of November, and anchored next afternoon in Clarence Cove, not having lost a single life, and all being in tolerable health.

The 'Pleid,' as might have been expected from her experienced designer Mr. Laird, answered admirably, and was in every respect

beautifully adapted for the purpose intended. Most of her officers were carefully selected, and I have in particular to mention the conduct and the assistance I derived from the chief mate, the chief engineer, and the surgeon. Of my own party, I can hardly speak in too high terms of the ability or the behaviour of Mr. May, who contributed greatly towards the success of the expedition; and I had in Mr. J. T. Dalton a very active zoological assistant. To one more person I must allude, namely, the Rev. S. Crowther, who, by his amiable character, his unassuming behaviour, and the quiet, yet perfect manner in which he discharged his duties, endeared himself to all on board.

In conclusion I would only remark that, from all appearances, there is less war and turmoil and greater feeling of security along the river than formerly, as detached huts and patches of cultivated ground are now to be seen all along the banks, none of which, I am assured by Mr. Crowther, existed during his visit in 1841.

Table of some of the principal Positions.

	Lat. N.	Long. E.
Agbéri	5° 14' 41"	...
Abé	5° 31' 16"	6° 29' 11"
Adamagh	6° 31' 12"	6° 39' 23"
Iddá	7° 6' 9"	6° 42' 14"
Igbégbé	7° 44' 33"	6° 44' 27".5
Yimahá	7° 59' 14"	7° 9' 47"
Okétta	8° 2' 34"	...
A'batsbo	8° 1' 0"	7° 35' 23"
Dágbó	7° 59' 30"	7° 53' 41"
A'kpoko	7° 55' 34"	8° 5' 22".5
O'jogo	7° 45' 8"	8° 28' 31".5
Rógon-Kóto	7° 45' 45"	8° 40' 12".5
Gándiko	8° 10' 39"	9° 42' 7".5
Zhibá	8° 18' 32"	9° 56' 17"
Gàrowa	9° 8' 36"	11° 0' 37".4
Djin	9° 22' 0"	11° 25' 7".4
Dulti	9° 30' 0"	11° 30' 0"

IV.—*A Journey from El-Mediná to Mecca down the "Darb el Sharki" on the Eastern Road (hitherto unvisited by Europeans) in September 1853.* By RICHARD F. BURTON, Lieut. Bombay Army.

Read, March 12, 1855.

To the SECRETARY of the Royal Geographical Society, London.

SIR,—At 8 A.M. on Wednesday 31st August the camel-shaykh suddenly appeared, warning us that we must lose no time in loading. All started up, and at 9 I found myself standing opposite the Bab el Misri, or eastern gate of the city, surrounded by my Madani friends, who had accompanied me thus far on foot, to take leave with customary politeness. After many affectionate

embraces and parting mementos, we mounted. In company with some Turks and Meccans (for Shaykh Masud had a string of 9 camels) we passed through the Bab el Saghir, or "little gate," of the Munakhah suburb, near the castle, and turned our course towards the N. On our right lay the palm groves which conceal this part of the city, and far to the left rose the domes of Hamzah's Mosques at the foot of Mount Ohod.

After an hour's slow marching towards the N. and N.E. we fell into the Nejd road, and came to a place of fame called Ghadir, *الغدير*, or "the Basin." * Here historians locate the battle of Boas, celebrated in the pagan days of El-Mediná (circa A.D. 615). It is a hollow in the plain, and conducts the drainage towards the northern hills. The skirts of Ohod still limited the prospect to the left; on the right was the well of Rashid, and the little whitewashed dome of Ali-el-Urays, a holy man whose tomb is visited by devotees. There we halted for a while, and turned round to enjoy a parting view of the Holy City. All the pilgrims dismounted, and took a fond and yearning leave of the venerable minarets and the green dome, to them the most interesting spot on earth.

Remounting, at noon we crossed a *fiumara*, which runs, according to my camel-shaykh, from N. to S., proving that we were now emerging from the Mediná basin. The sky began to be clouded over, although the air was still full of *simum*, held to be unwholesome here from the alternation of hot blasts from the plains and cold draughts from the hills. Travelling over a rough, stony, and thorny path, we arrived about 2 P.M. at the stream of lava heard of by Burekhardt.† The aspect of the country was strictly volcanic, abounding in basalt and in scorie more or less porous. The lava appeared in a large broad band, black and veiled with drift sand; a considerable portion is probably concealed, which makes the descriptions of the Arab historians sound exaggerated. I made diligent inquiries about the existence of active volcanoes in this part of El Hejaz, but no one could tell me of any.

At 5 P.M., travelling towards the E., we entered a *bughaz* or pass, which follows the course of a wide *fiumara*, walled in on both sides by steep and barren hills—the portals of a region too wild even to support Bedouins. The torrent-bed was in places narrow, with abrupt turns, and the drift of stones showed that after rains a violent stream, sometimes 7 feet deep, runs from S.E. and E. to W. and N.W. Water is at all times close to the

* Dictionaries translate the word "pool;" here it is applied to places where water stagnates after rain.

† Travels in Arabia, vol. ii, p. 217. The Swiss traveller was prevented by sickness from visiting it.

surface, as evidenced by a sparse growth of acacia, camel-grass, and the dúm or Theban palm. In some parts I remarked what is technically called "hufrah," "holes," dug for water like wells in the sand, and my guide assured me that there is a spring flowing from the rocks.

After the long and sultry afternoon, beasts of burden began to sink in numbers, and troops of Takruri pilgrims disputed with flights of rakham * the precious morsels. Two hours' slow marching up the fiumara eastward led us to an abrupt turn towards the S. We then left it for rising ground. Already it was growing dark. An hour, however, elapsed before we saw at a distance the twinkling lights and heard the watch-cries of our camp. It was pitched in a hollow among hills, and was in excellent order; the pacha's pavilion surrounded by his soldiery and guards disposed in tents, with sentinels regularly posted around the outskirts of the encampment. One of our men, whom we had sent forward, met us at the entrance, and led us to an unoccupied spot, where we unloaded the camels, raised our canvas house, lighted fires, and prepared with supper for a good night's rest. Living is simple upon such a march. The pouches in and out of the *shugruf* or litter, contain bread, cheese, dates, limes, and water, with which you supply yourself when inclined. At certain hours of the day ambulant vendors offer you sherbet, lemonade, hot coffee, and water-pipes admirably prepared; and when you halt, provisions are cooked, generally boiled rice, or the mixture of rice and vetches called "kichri," with a relish of onions or limepickle, and rarely a little meat.

We arrived at our first halting-place, Ja-el-Sharifah, which was the rendezvous of the scattered parties of the caravan, at 8 P.M., after a march of 22 miles.† This station lies 50° S.E. of El-Mediná, and belongs rather to Nejd than to El-Hejaz.

Thursday, September 1.—At 3 A.M. we were roused by the roar of the signal gun, struck the tent, loaded the animals, mounted, and found ourselves hurrying through a dark pass in the hills towards the S.E. It was now our object to obtain a good place in the caravan, as travellers generally adhere to that first chosen. As might be expected, we met with a variety of minor

* A foul vulture, or rather kite, with a dirty yellow plume, and wings partly black. It is the Ukab of Sindh.

† A day's journey in Arabia is generally reckoned at 24 or 25 (Arab) miles. Abulfeda leaves the distance of a "marhalah" (or manzil, a "station") undetermined. El Edrisi reckons it at 30 miles, but speaks of short as well as of long marches. The only idea the Bedouin of El-Hejaz, and indeed of Arabia generally, has of distance is the "saut" or hour's walk, and the manzil or stage. The former varies from 2 to 3½ miles, and the latter from 15 to 25. Twelve hours' marching, with an occasional halt for the sake of the camels, is considered good average work.

accidents, camels falling, gugglets breaking, shugdufs bumping against one another, and plentiful bad language. We travelled on till 6 A.M., at which hour we emerged from the black pass. The sun rose upon us, disclosing a large hollow basin of coarse gravel, resting upon hard clay. It is about 5 miles broad by 12 long, collects the waters of the high grounds after rain, and distributes its surplus through an exit towards the N.W., in the low undulating hills that surround it. At the entrance we dismounted, prayed, breakfasted, and then proceeded to cross the plain. Even at this early hour the country reeked with abundant vapour, extracted by the fiery breath of the sun. About noon, however, the sky again became cloudy, and nought of colour remained, but that white haze, dull, but glaring withal, which is the prevailing day-tint in these regions. At this hour we reached a narrowing of the basin, where from both sides "irk" or low hills stretched their last spurs into the plain. But after half a mile it again widened to about half its previous breadth. At 2 P.M. we turned our course towards the S.W., ascended stony ground, and one hour afterwards found ourselves in a desolate, rocky flat, among the hills called Mahattah * Ghurab. That day our route was unusually winding, and the distance travelled over did not exceed 24 miles. Ghurab lies amongst the irregular masses of hill which lead to the highlands of Nejd, 10' S. W. from our last night's resting-place. Here we found water in some wells at a distance of about 2 miles, and had to pay 10 piastres for a couple of skins' full. The irregular cavalry has a pernicious practice of occupying water in force, and of compelling travellers to be generous or to die of thirst. We passed a pleasant evening at Ghurab. I began to like the old Shaykh Masud, who, on his part, thought me worthy to hear his battles, his genealogy, and his family affairs. The rest of the party could not repress their contempt when they heard me putting divers questions about torrents, hills, and the directions of places. "Let the Father of Mustachios † be," said the old man; "he is friendly with the Badu, and knows better than you all!"

Friday, September 2nd.—The hateful signal gun awoke us at 1 A.M., and we travelled drowsily for 4 hours, through utter darkness, over a country which, to judge from the stumbling of the camels, was rough and stony. At half-past 5 A.M. we entered a

* "Mahattah" means a spot where you take down luggage, *i.e.* a station. By some Hejazis it is used in the sense of a halting-place where you spend an hour or two.

† The Bedouins of El-Hejaz belong for the most part to the Shafei school, which delights in clipping or even in shaving the moustachios and the perioral region. Like all Arabs they must have a nickname for every one of God's creatures. "Khalik ma el Badu"—a friend with the Bedouin—is a proverbial saying, and means that you are no greasy burgher.

spacious basin, at least 6 miles in breadth, overgrown with acacia-trees—mere vegetable mummies—and camel-grass: in many places it showed a water-mark, and here and there the ground was pitted with recently dried-up pools. After an hour's rapid march we toiled over a rugged harrah or ridge, composed of broken and detached blocks of basalt and scoriæ, fantastically piled up and dotted thinly with thorn-trees. Shaykh Masud went to and fro along the line of camels, addressing his charges with a "Place yourselves forward" (in the litter) as we ascended, and "Throw yourselves backward" during the descent. I know not which to admire the most, the circumstance of our shugduf not slipping over the crupper, or the sure-footedness of our dromedaries. The animals stepped from block to block slowly and staidly, assuring themselves of their forefeet before they trusted all their weight to advance. They moaned, however, piteously, for the sudden turns of the path puzzled them; the descent was even more troublesome than the ascent; the rocks were hot and cutting, deep holes yawned between the blocks, and now and then an acacia would catch the shugduf, almost overthrowing the hapless bearer by the suddenness and the tenacity of its grasp. This passage took place during daylight; but we had many at night, which I shall not describe, nor forget.

Descending the ridge, we entered another hill-encircled basin of gravel and clay. In many places piles of basalt and crumbling streaks of hornblende schist, disposed edgeways, green within and sunburnt to blackness, cropped out of the ground. At 10 30 A.M. we found ourselves in an "acacia barren," one of those thorny places that pilgrims dread, and which give rise to many scenes, comic as well as tragic. On the left the road was flanked by an iron wall of basalt. Noon brought us to another ridge, whence we descended into a second wooded basin surrounded by hills. We were persecuted by the simum, and the air was filled with those majestic pillars of sand so graphically described by Abyssinian Bruce. At 1 P.M. we crossed a fummara, and in an hour afterwards we pursued the course of a second. Old Masud called this the Wadi el Rahmah, and assured me that it runs from the E. and the S.E. in a northern and north-westerly direction to the Medinâ plain. Early in the afternoon we reached a diminutive flat on the bank, or rather a wide bulge in the torrent-bed: around it were hills everywhere, except about the road, which we could see running into the far distance, over a "mahjar" or stony ground, black as usual in El-Hejaz. Some opined that the caravan would cross the mahjar and halt beyond it. We were soon tired of discussion, alighted, and, in a burning sun, pitched the tent. Shaykh Masud called the place "Hijriyah;" according to my computation it is 25 miles and S.E. 22° from

Ghurab. We found an abundance of water, and in the evening were rewarded for our disappointment in not seeing the new moon by the prospect of a fine nimbus discharging its blessed load on the western hills.

Saturday, Sept. 3.—We loitered at El-Hijriyah, though the camel-shaykh warned us that we had a long day's march to make. At 7 A.M. we crossed the grim mahjar by a cruel footpath, and at 9 struck into a broad *sumara* which runs from E. towards the N.W., its bed overgrown with acacia, the *senna* plant, different species of *euphorbia*, the wild *capparis*, and the *dûm* palm. Up this line we travelled the whole day. About 6 P.M. we came upon a basin at least 12 miles wide, which absorbs the water of the adjacent hills. Accustomed as I have been to mirage, a long thin line of salt efflorescence appearing at some distance on the plain below us, when the shades of evening began to fall thicker, completely deceived me. Even the Arabs appeared divided in opinion. Beyond, upon the horizon, rose dark fortlike masses of rock, which I mistook for buildings, the more readily as Shaykh Masud had informed me that we were approaching a populous place. At last, descending a long steep hill, we entered upon the plain, and discovered our error by the crouching of camels' feet upon large curling flakes of a nitrous salt, overlying caked mud. Hereabouts the Arabs call this phenomenon "*bahr nûth*,"—a sea of salt; in other places it is known as the "*bahr bila ma*," or waterless sea. Those civilised birds, the crow, kite, and martin, now warned us that we were in the vicinity of a town. It was not, however, before 11 P.M. that we entered the confines of El-Suwayrkiyah—a fact most patent to us by the stumbling and falling of the dromedaries over the ridges of dried clay disposed chequer-wise upon the fields. Then came other obstacles, such as garden walls, wells, and hovels, so that midnight had elapsed before our weary animals reached their resting-place.

Sunday, Sept. 4.—Rising betimes in the morning, I proceeded to inspect the town of El-Suwayrkiyah. It is situated about 28 miles from Hijriyah, and, according to my reckoning, 99 miles along the road from El-Mediná. Its bearing from our last station was S.W. 11° . Some geographers, therefore, place it much too far towards the centre of Arabia. Here the territory of the Meccan sherif begins, and the pachalik of El-Mediná ends.

The town is small, consisting of about 100 houses. It is built upon the side and at the base of a mass of basalt, which rises abruptly as though raised by the hand of man from the clayey plain. The summit is converted into a *fortulice*—in these lands no town can lack one—by a rough bulwark of stones piled up, so as to make a parapet. The lower part of the settlement is also protected by a mud wall with the usual semicircular towers.

Inside there is a bazár well supplied with meat, principally mutton, by the Bedouins of the neighbourhood, and dates, wheat, and barley are grown near the town. There is little to describe in the narrow streets or the mud houses, which are essentially Arabian. Outside, the country bears traces of cultivation, the fields are divided by ridges and stone walls, there are some fine palm-plantations, and the wells are numerous. The water is not deep below the surface, but it has a brackish taste, sensible enough after a day's use, and the effects are emphatically the reverse of chalybeate.

The town is inhabited by the Beni Husayn Sayyids, a race of schismatics, noticed by Burekhardt.* They claim the allegiance of all the Bedouin tribes around, and pay fealty, in name only I was told, to the Meccan sherif.

We made a half-halt at El-Suwayrkiyah, and, determining to have a small feast, I bought some fresh dates and a sheep for a dollar and a half. Arab travellers consider liver and fry a dish to set before a shaykh; on this occasion, however, our enjoyment was marred by the brackishness of the water—a civic feast would lose by being washed down with a thin solution of Epsom salts.

At 10 A.M. we started in a south-easterly direction, and travelled over a plain thinly dotted with desert vegetation. At 1 P.M. we came to a basaltic ridge, and then entering a long depressed line of country, which could scarcely be called a valley, paced down it 5 tedious hours. The simum, as usual, was blowing, and it seemed to affect every one's temper. At 6 P.M., before the light of day had faded, we traversed a rough and troublesome ridge. Descending it, our course lay in a southerly direction; the road was flanked on the left by low hills of red sandstone and bright porphyry. About an hour afterwards we came to a long basalt-field, through whose blocks we threaded our way slowly and painfully, for it was now dark. At 8 P.M. the camels began to stumble over the little divisions of the wheat and barley fields, and presently we came to our halting-place—a large village called El-Sufayna. The plain was already dotted with tents and lights. These belonged to the Baghdad caravan, whose route here falls into the Darb el Sharki. It consists of a few Persians, Kurds, and tribes contiguous to the capital of the Caliphs, collects *en route* the people of north-eastern Arabia, Wahhabis, and others, and is escorted by the Agayl tribe of Bedouins and the fierce mountaineers of Jebel Shamar. Scarcely was our tent pitched

* Travels in Arabia, vol. ii. p. 239. "In the Eastern Desert, at 3 or 4 days' journey from Mediná, lives a whole Bedouin tribe called Beni Aly, who are all of the Persian creed." The traveller, however, confounds the Beni Husayn Sayyids of El-Suwayrkiyah with the Beni Ali Bedouins who live about Kuba, near El-Mediná.

when the distant spitting of musketry and an ominous beating of the kettle-drums announced a disturbance. The Baghdad caravan, it afterwards appeared, though not more than 2000 in number, men, women, and children, had been proving to the Damascus caravan that, being perfectly ready to fight, they were not going to yield in any point of precedence. From that time the two bodies encamped at a distance about a mile one from the other. We had travelled 17 miles. The direction of El-Sufayna from our last halting-place was S.E. 5°. Though it was dark when we encamped, the Shaykh Masud set out to water his moaning camels, who had not quenched their thirst for 3 days. He returned in a melancholy mood, having been charged by the soldiers at the well 40 piastres (8s.) for the luxury.

Monday, Sept. 5.—After a delightfully cool night we arose at 5 30 A.M. and prepared to start. There is nothing to see in the village of El-Sufayna: it consists of 50 or 60 mud-built, flat-roofed houses, surrounded by the usual mud rampart and turrets; the bazár at this season is well supplied, even fowls being procurable, and the country around produces dates, wheat, barley, and maize.

We travelled towards the S.E. and entered a country destitute of the low ranges of hill which from El-Mediná hitherto had bounded the horizon. After 2 hours' march our camels climbed up a precipitous ridge, and then descended into a broad gravel plain. From 10 to 11 A.M. our course was southerly, over high table-land, and we afterwards traversed for 5h. 30m. a plain which bore signs of standing water. This day's march was peculiarly Arabic—a "*Sahara la Siwahn*," as my companions called it, "a desert where is no living thing but Allah." The horizon was a sea of mirage, and fantastic streams gushed over every descent. Gigantic columns of sand whirled about the plain, and on both sides of our road were piles of bare rock standing detached upon the surface of sand and clay. Here they appear in oval lumps heaped up with a semblance of symmetry; there a single boulder stands with its sharp foundation resting upon a pedestal of low dome-shaped rocks: all are of coarse pink granite, which flakes off in large crusts under the influence of the atmosphere, and I remarked one block which could not have been less than 30 feet high. Through these scenes we continued travelling till about 4 30 P.M., when the guns suddenly roared a halt. There was not a trace of human habitations around us. Shaykh Masud guessed correctly the reason of our detention in these inhospitable wilds. "Cook your bread," said he, "and boil your coffee, for the camels are a little tired, and the gun will soon sound again."

Our present station was called the "halting-place of the Mutayr," a clan of ruffians which infests these parts. We had

passed over about 18 miles of ground, and our present direction was S.W. of Sufayna 20°.

At 10 30 that night we heard the signal of departure, and as the moon was still young we prepared for hard work. Our course was south-westerly, through what is here called a *waar*—rough ground and thickety plains. The camels tripped and stumbled, tossing their litters like cock-boats in a short sea; at times the shugdufs were well nigh torn from their backs by the pitiless thorn-trees, and nothing could be wilder or more picturesque than our passage over the basaltic fields and ridges. The morning broke as we entered a wide plain. In many parts were traces of water, but no such luxury now met the eye. Lines of basalt here and there seamed the surface, and in many places wide sheets of tufaceous gypsum, called by the Arabs *sabkhah*, shone like mirrors set in the russet framework of the plain. After our fatiguing night, day came on with a sad sensation of oppression, and we were disappointed in our expectations of water, which usually abounds in this station, as its name "El-Ghadir" denotes. At 10 A.M. we pitched our tent, after a march of about 20 miles. The direction of the night's journey was S.W. 21°.

Tuesday, Sept. 6.—The Pacha gave the signal for departure at 6 P.M. We mounted and traversed the eastern plain. A heavy shower was falling among the western hills, which sent forth damp and dangerous blasts. Between 9 P.M. and the dawn of the next day we witnessed a recurrence of the last night's scenes, over a road so rugged and dangerous that I wondered how men could prefer to travel there by night. But the sturdy camels of Damascus were now worn down by fatigue; they could not endure the sun, and our time was so short that we could not afford a day's halt. My night was spent upon the front bar of my shugduf, encouraging the dromedaries; and that we had not one fall excited my extreme astonishment. At 5 A.M. we entered a wide plain thickly dotted with the common thorny trees, in whose strong grasp many a litter lost its covering, and not a few were dragged with their screaming inmates to the ground. About 5 hours afterwards we crossed a high ridge and saw below us the camp of the caravan not more than 2 miles distant; and at 11 A.M. we reached the station, which is about 24 miles from El-Ghadir, in the direction S.E. 10°. It is called El-Birkat,* or the Tank, from a now ruinous receptacle for water built of hewn stone by the Caliph Harun el Rashid. The land belongs to a tribe of Bedouins called Utaybah, reputed to be the bravest and the most ferocious in El-Hejaz;

* In this country a "birkat" may be an artificial cistern or a natural basin smaller than a "ghadir."

and the citizens denote their dread of them by asserting that they drink the blood of slain foemen in order to increase their courage.* The Pacha allowed us a rest of 5 hours at El-Birkat.

Wednesday, Sept. 7.—We left El-Birkat at 4 p.m., and travelled eastwards over rolling ground, thickly wooded. There was a network of paths through the thickets, and the moon was mostly clouded: the consequence was almost inevitable loss of way. About 2 a.m. we began ascending hills in a south-westerly direction, and presently fell into the bed of a wide rock-girt fiumara, which runs from E. to W. The sands were overgrown with saline and salsolaceous plants—*Coloquintida*, *Senna*, the *Rhazya stricta*, and a luxuriant variety of the *Asclepias gigantea*, whose broad leaves were cottoned over with mist and dew. At 6 a.m. we left the fiumara, and turning to the W., arrived about an hour afterwards at the station. “El-Zaribah,” “the valley,” is an undulating plain amongst high granite hills. In many parts it was faintly green; water was close to the surface, and rain stood upon the ground. During the night we had travelled about 23 miles, and our present station was S.E. 56 of our last.

Thursday, Sept. 8.—After eating and sleeping we prepared for the ceremony of El-Ihram,† or assuming the pilgrim garb, El-Zaribah being the “mikat,” or appointed place for the rite. Between the noonday and the afternoon prayers we bathed, and then the barber shaved our heads; after which we deposited our laical clothes, and invested ourselves with the two long cotton cloths, the same as those used in the Cairo baths, which compose the religious toilette. Our heads and feet were naked, a state by no means suited to the September sun in Arabia; and a leathern purse was the only article we were allowed to carry round our necks. Then came long prayers, and a drowsy exhortation to be good and faithful pilgrims, to abstain from the enormously long list of things forbidden to the faithful at this season, and diligently to cry the “Talbiyat” at the height of our voices. This is a short prayer which derives its name from the first word of the four sentences comprising it.

Here I am! (lablayk) O Allah! here am I!

No sharer hast thou; here am I!

Verily the praise and the benefit are thine, and the kingdom!

Here I am! O Allah! here am I!

* Some believe this literally, and it is the only suspicion of cannibalism attaching to El-Hejaz. Possibly such a thing might take place after a fight when more than usual Bedonin rancour has been displayed. Who does not remember the account of the Turkish officer licking his blade after having sabred the body of a Russian spy?

† El-Ihram—literally meaning “the prohibition”—is applied to the ceremony of putting on the pilgrim’s garb and the dress itself.

It is a serious interruption to profitable conversation, for whenever you begin talking upon indifferent matters with a sensible man, he—if there be hearers—replies by asking what has become of your “Talbiyat.” And this lasts till the return to Mecca from Muna.

Friday, Sept. 9.—We left El-Zaribah at 3 p.m., travelling towards the S.W., and a wondrously picturesque scene met the eye. Crowds in the pilgrim dress, whose whiteness glittered upon their dark skins, Bedouins galloping their blood camels, fierce Wahhabis following their enormous kettle-drum and green flag flaunting in the wind, Turkish grandees, fair-haired Syrians, sable Africans, chocolate-coloured Indians, and a score of other nationalities, all urging their camels wildly and shouting the Talbiyat with willing lungs. Looking back at El-Zaribah soon after our departure, I saw a heavy nimbus settled upon the hill tops, and the growling of distant thunder smote our ears joyfully. We had hoped for a shower, but were disappointed by a dust storm, which ended with a few heavy drops of rain.

At 5 p.m. we entered the wide bed of a *fumara*, down which we were to travel all that night. It varies in breadth from 150 feet to about $\frac{1}{2}$ of a mile. Its course, I was told, is towards the S.W., and it enters the sea near Jeddah. The channel is a coarse sand, with here and there masses of sheet rock; and it bears in some places the vegetation usually found in *fumaras*. It is everywhere flanked by dark and barren buttresses of rock. Half an hour's ride brought us to a suspicious-looking place. On the right was a precipice, at the base of which flows the stream when there is one; and to this half of the channel was our road limited by the stones and thorns that covered the other portion. The left almost reflected the right side; and opposite, the way seemed to be barred by piles of hills. Day still smiled upon the upper peaks, but the lower slopes and the *fumara* bed were already curtained with a grey and sombre shade.

A damp fell upon the pilgrims' spirits as they approached the place. The men ceased their loud prayers, and the very women became silent. While still puzzled by this phenomenon, an explanation was vouchsafed to me. A small curl of blue smoke, like a lady's ringlet, on the summit of the right-hand precipice, caught my eye; and simultaneous with the matchlock's echoing crack, a high-trotting dromedary in front of me rolled over upon the sands. A bullet had split his heart, throwing his rider a goodly somerset of 5 or 6 yards.

Then came a scene of confusion and hurry which jammed the whole line into a solid mass. Shrieks, groans, curses, orders and counter-orders, with an occasional “*phit*” and a death-cry—the Utaybah seldom missed—lasted about half an hour. At length

the bold Wahhabis beat off the robbers, and our halt was exchanged for a kind of flight, in which all Shaykh Masud's skill was barely sufficient to steer our desert-craft clear of danger. That many fell was evidenced by the quantity of boxes and baggage strewn the ground. I had no means of ascertaining the number of men killed and wounded, reports were so contradictory and exaggeration so rife. The robbers were said to be 150 in number. Their object was plunder: they would eat the dead camels; but their principal ambition was to boast, "We, the Utaybah, on such a night, stopped the Sultan's mahmal one whole hour in the pass."

That night we travelled down a chasm between dark and formidable rocks, and the roughness of the road caused many small accidents. Dawn broke whilst we were still in the *fumara*, which here is about 100 yards wide. The granite hills on both sides were now less precipitous, and the borders of the torrent were natural quays of stiff clay, which showed a water-mark of from 12 to 15 feet in height. In many parts the bed was muddy, and the moist places as usual caused the camels to fall. We then turned northwards, and came in sight of the trees of El-Mazik, more generally known as Wadi Laymun, the "Lime-valley," from the quantity of its fruit. Here, on the right hand, stood the Meccan Sherif's tent, surrounded by his attendants, and duly prepared to receive the Pacha of the caravan. We advanced about half a mile, and at 8 A.M. encamped temporarily in a hill-girt bulge of the *fumara*. We had travelled about 24 miles from El-Zaribah, and the direction of our present station was S.W. 50°.

Saturday, Sept. 10.—Shaykh Masud warned us that we should only have 4 hours' halt, as it would be advisable to precede the great body of pilgrims. After breaking our fast upon the produce of the lime, the pomegranate, and the date trees, we sallied forth to enjoy the sight of verdure and listen to the melody of flowing waters. A line of the great Arabic poet Lebid—

Time-worn as primal writ that dents the mountain's flinty face,

led me to suspect the existence of ancient inscriptions in this part of El-Hejaz. I had no time, however, for research, and could derive no information from my companions. Some months after my return to India the Abbé Hamilton wrote to me that he had discovered in Wadi Laymun one of the rock monuments of Sesostris (Rhamses II.). Future travellers, therefore, will do well to examine this valley, which is accessible and comparatively civilized, the citizens of Mecca using it as a picnic and watering place.

Exactly at noon Shaykh Masud seized the halter of the foremost

camel, and we started down the fiumara girt with orchards. At 2 P.M., travelling towards the S.W., we arrived at a point where the torrent-bed winds to the right, and, quitting it, we climbed with difficulty over a steep ridge of granite. A little before 3 we entered a large hill-girt plain, which my companions called Sola. In some places were clumps of trees, and two or three villages warned us that we were approaching a city. Far to the left rose the blue peaks of Taif, and the mountain-road was pointed out to me. Here I first saw the tree, or rather the shrub, which bears the Balm of Gilead (or Mecca), celebrated for its healing, tonic, and stomachic properties. At 4 P.M. we came to a steep and rocky pass, up which we toiled with considerable difficulty. The general face of the country was rising once more, and again presented the aspect of numerous basins divided and surrounded by hills. As evening approached we halted for prayer, and tried, but in vain, to catch sight of Mecca, which lies in a winding valley. Then remounting, we journeyed through the darkness of night. At about 1 A.M. I was aroused by a universal excitement. "Mecca! Mecca!" cried some voices; "The Sanctuary! O the Sanctuary!" exclaimed others, and all burst into loud "labbaykas," not unfrequently broken by sobs. I looked out from my litter, and saw by the light of the southern stars the dim outline of a large city, a shade darker than the surrounding plain. We were passing over the last ridge by an artificial cut called the Saniyah Kudaa. It is flanked on both sides by watch-towers which command the entrance to the Darb el Maala, or road leading from the N. into Mecca. Thence we passed to the Maabadah,* or northern suburb, in which the Sherif's palace is built. After this, on the left hand, came the deserted abode of the Sherif bin Aun, now said to be a "haunted house:" opposite it lies the Jannat el Maala, the holy cemetery of Mecca. Thence, turning to the right, we entered the Sulaymaniyah or Afghan quarter, and exchanging the main road for a bye-path we ascended by narrow lanes the rough heights of Jebel Hindi, upon which stands a small, whitewashed, crenellated building called a fort. Descending, we traversed several dark streets, in some places crowded with rude cots supporting dusky figures, and finally, at 2 A.M., we heard the shrill cries of joy with which my companion's mother received him. From Wadi Laymun to Mecca according to my calculation, the march was about 23 miles, the direction S.E. 45°.

The following is an itinerary of our marches,† which, protracted on Burckhardt's map, offers an error of at most 10 miles:—

* El Edrisi, and after him Sale, call this place "El Marbaah." I never heard the word at Mecca.

† I paid 20 dollars—advancing half that sum as earnest-money—for two camels and part of a beast to carry our water-skins. The shaykh was also bound to

					Miles.
1.	El-Mediná to Ja-el-Sharifah	S.E.	50°	..	22
2.	Ja-el-Sharifah to Ghurab	S.W.	10°	..	24
3.	Ghurab to El-Hijriyah	S.E.	22°	..	25
4.	El-Hijriyah to Suwayrkiyah	S.W.	11°	..	28
					— 99 miles.
5.	Suwayrkiyah to Sufayna	S.E.	5°	..	17
6.	Sufayna to halting-place of the Beni Mutayr	S.W.	20°	..	18
7.	Thence to El-Ghadir	S.W.	21°	..	20
8.	El-Ghadir to El-Birkat	S.E.	10°	..	24
9.	El-Birkat to El-Zaribah	S.E.	56°	..	23
10.	El-Zaribah to Wadi Lāymun	S.W.	50°	..	24
11.	To Mecca	S.E.	45°	..	23
					— 149 ..
	Total English miles				248

The general face of the country along this line is a succession of low plains, here quasi-circular, there irregularly oblong, surrounded by diminutive hills, cut by fūmaras. Their basins are divided by belts of basalt and greenstone. The ridges may average from 100 to 200 feet in height; often they are in the form of prisms; sometimes the summit is a flat plain. The landward faces of the hills are disposed at a sloping angle, contrasting strongly with the precipitous rise of their seaward sides, and there does not appear to be any regular range within and parallel to the maritime chain. Nowhere have I seen a land richer in volcanic and primary formations,* or one where earth's anatomy is laid so bare. It is a country of lofty hills, abrupt and vertical, with black and barren flanks ribbed with fissures, furrows, and dingles, crowned by turreted and castellated heights, with wide and formidable chasms between. The predominant formation was basalt, here porous and cellular, there black and compact; again coarsely gritty, of a tarry colour, and, when fractured, shining with bright points. Hornblende of a fine black abounds at El-Mediná, and throughout this part of the Hejaz; it generally crops out of the ground, presenting edges from which pieces are easily detached, and darkened by the sun and air. Greenstone, diorite, and actinolite are found, but they are not so abundant as those above mentioned. Next to these come the granites, called

convey us to and from Mount Arafat, but during the whole time he and his son were to be supplied with raw or cooked provisions out of my stores. I bought a new shugdūf or litter for 80 piastres (16s.), and for 15 a shibriyah (cot) for my servant. We laid in provisions for 14 days, although the journey never takes more than 12; but Bedouins are hungry, and pilferers abound. The stores consisted of rice, wheat flour (to be kneaded into bread), unleavened bread of two kinds, cheese, onions, turmeric, dates, limes, tobacco, sugar, tea, and coffee. We had three water-bags, two large and one small; in this country they demand the traveller's utmost attention. Large harádiyāh, or water-gugglets, bought at El-Mediná, furnished us with ready drink in the litter.

* I collected a few specimens on the line of march, and, after returning to Bombay, submitted them to Dr. Carter (Sec. As. Soc. Bombay), whose name is a guarantee of accuracy.

in Arabic suwan. Some are of the pink, large-grained kind, before described; others are of a grey colour, exceedingly compact, capable of being cut into a smooth surface, and susceptible of high polish. This latter is the material of which the Baitullah or Kaabah is built. The syenite is generally speaking coarse, but there is a rich red kind which at once strikes the eye. I have never seen eurite or euritic porphyry but in small pieces, and the same may be said of the petrosilex and milk-quartz. In some parts, particularly between Yambu and El-Mediná, there is an abundance of tawny-coloured gneiss, presenting a marked appearance of stratification. The transition formations are represented by a fine calcareous sandstone of a bright yellow, like ochre, which is used at Mecca in the external ornamentation of houses, bands of this stone being here and there inserted into the courses of masonry. There is also a small admixture of the greenish sandstone, found so abundantly at Aden. The secondary formation is represented by a fine limestone, in some places almost fit for the purposes of lithography, and a coarse gypsum, often of a tufaceous nature. The coast is wealthy in coralline, of which, indeed, the maritime towns are principally built. For the superficial accumulations and the face of the desert, the reader may be referred to any description of the country between Cairo and Suez.

To conclude with a few remarks upon the watersbed of El-Hejaz. From El-Mediná to El-Suwayrkiyah the beds of fumaras abound, generally running from the E. and S.E. towards the W. and N.W. From El-Suwayrkiyah to El-Zaribah they cease, their place being taken by "Ghadir" or basins, in which water stagnates. Beyond El-Zaribah the traveller enters a region of Misryal (fumaras), tending W. and S.W. The water obtained by digging is good where the rain is fresh in the fumaras; saltish, so as at first to taste unnaturally sweet, in the plains; and bitter in the basins and low lands, where nitre effloresces and the water has had time to be tainted.

The country in my humble opinion has a compound slope. It falls towards the W., as the direction of the torrent-beds shows. I regret not having a better proof than Arab opinion for my belief that the country also declines from N. to S. This, as geographers are aware, is a disputed point. Ritter, Jomard, and some Arab authors make the peninsula rise towards the S. Wallin and others support an opposite opinion. But all the modern Arabs declare El-Hejaz to be lower than Mesopotamia, assert that the general course of water is from N. to S., and believe the spring at Arafat to flow underground from Baghdad.

I beg to propose this profile of the country through which I marched:—From the sea to Mughhal is a gentle rise. The

watermarks of the fiumaras show that El-Mediná is considerably above the level of the sea; and though geographers may not be correct in claiming for Jebel Radhwa (near Yambu) a height of 6000 feet, that elevation does not appear too great for the plateau upon which is the Prophet's burial place. From El-Mediná to El-Suwayrkiyah is another gentle rise, and from this to El-Zaribah stagnating waters would argue a level. It is this circumstance most probably that has given rise to reports about a perennial lake on the eastern boundary of El-Hejaz, in which I believe as little as in the fiumara turned into a river and placed by Ptolemy between Yambu and Mecca. The lake probably owes its existence to similar conditions—a heavy fall of rain. Beginning at El-Zaribah is a decided fall, which continues with minor intervals to the sea. The Arafat torrent sweeps from E. to W. with great violence, sometimes carrying away the habitations and even injuring the sanctuary of Mecca.

I venture to hope that the delay in forwarding this paper will be attributed to its true cause—the heavy calls upon my time in making preparations for penetrating into Eastern Africa. Shortly after the hot season I start again from Aden as a Mohammedan trader to visit a part of the country whence the Ameer—silly young man!—has determined to avert the danger of Europeans by threatening their throats. On my return I will, with your permission, forward a copy of my notes; they may be valuable in some points, for the *country is utterly unknown*. But again, unhappily for me, it will be impossible to use anything but watch and pocket compass.

V.—*Narrative of a Trip to Harar.* By RICHARD F. BURTON,
Lieut. Bombay Army.*

Read, June 11, 1855.

IN May, 1849, the late Admiral Sir Charles Malcolm, an ardent geographer and a warm encourager of adventure, in concert with the President and Secretary of the Royal Geographical Society, urged upon the Honourable the Court of Directors of the East India Company the desirability of ascertaining the productive resources of the Somali country; but the project lay in abeyance until March, 1850, when Sir Charles Malcolm offered the charge of an expedition to Dr. Carter, of Bombay, an officer well known as surgeon to the 'Palinurus' during the maritime survey of Eastern Arabia. The state of that gentleman's health and the

* See Report on the Position of Harar, &c., by Lieut. Barker. *Journal of the Royal Geographical Society*, vol. xii. p. 238.—Ed.

exigencies of the service caused certain difficulties, and the project was again given up for the time.

In March, 1854, after my return from Arabia to Bombay, I applied myself to the task of resuscitating the expedition. My plans were favourably received by Lord Elphinstone, the enlightened Governor of the Presidency, and by the local authorities, amongst whom the name of the Hon. William Lumsden, then member of council, will ever be remembered with the liveliest feelings of gratitude and affection. In August a despatch from the India House authorised the expedition. It was originally composed of three members—Lieut. Herne of the 1st Bombay Europeans, Lieut. Stroyan of the Indian Navy, and myself. The first-named officer was accustomed to survey, to daguerreotype, and to observe; and the second was distinguished by his surveys of the coast of Western India, in Sindh, and on the Panjáb rivers. Soon afterwards the expedition received an addition in Lieut. J. H. Speke, of the 46th regiment Bengal N. I., who had spent many years in collecting the Fauna of Tibet and the Himalayan mountains, and who volunteered with ardour to become a sharer in the hardships and the perils of African travel.

Assembled at Aden, in the summer of 1854, we found the public voice so loud against our project, that I offered as a preliminary to visit Harar in disguise, thus traversing the lands of the dreaded Eesa clan, and entering a place hitherto closed to us by a ruler with the worst of reputations. I could not suppress my curiosity about this mysterious city. It had been described to me as the head-quarters of slavery in Eastern Africa, and its territory as a land flowing with milk and honey; the birthplace of the coffee-plant, and abounding in excellent cotton, tobacco, saffron, gums, and other valuable products. But when I spoke of visiting it, men stroked their beards, and in Oriental phrase declared that the human head once struck off does not regrow like the rose.

Our arrangements were soon made. Lieutenant Speke was detached to Guray Bunder, with directions to explore, if possible, the celebrated Wadi Nogal, and to visit the Dulbahantas, most warlike of the Somal. Lieutenants Stroyan and Herne established their camp at Berbera, the great mart and harbour of the Eastern coast; and they employed themselves in ascertaining the productive resources of the country; in mastering the subject of slavery—still, I regret to say, flourishing in these regions;—and in collecting carriage for a more extended journey. They were also directed, in case of my detention by the Emir of Harar, to demand restitution before allowing the great caravan, which supplies that city with the luxuries of life, to leave the coast.

In the mean time I prepared for a trip into the interior. The political resident at Aden, our possession in the Red Sea, assisted

me with two Somali policemen, and I provided myself with a small stock of cloth, tobacco, rice, dates, trinkets, and other articles with which a Moslem merchant would load his camels. I determined to travel as El Haj Abdullah, a personage of some sanctity. Perhaps my adventures and a short description of a city hitherto unvisited by Europeans may not be unacceptable to a Society which, though essentially scientific, does not withhold encouragement from the pioneer of discovery, reduced by hard necessity to use nature's instruments—his eyes and ears.

On the 29th October, 1854, I started from Aden in a Somali boat bound to Zayla, a small port on the African coast of the Red Sea, nearly opposite and about 140 miles from our Arabian settlement. After two days' sail we reached our destination, when I found that the mules, ordered three months before, and paid for, had not been procured. The governor, our old friend El Haj Shermarkay, sent immediately to the neighbouring port of Tajurrah; but between the delay of catching the animals and a contrary wind which delayed the vessel, I lost at Zayla twenty-eight days. Travellers, like poets, are mostly an angry race: by falling into a daily fit of passion, I proved to the governor and his son, who were profuse in their attentions, that I was in earnest. He supplied me with women (cooks), guides, servants, and camels—under protest, warning me that the road swarmed with brigands, that the Eesa had lately murdered his son, that the small-pox was depopulating Harar, and that the emir or prince was certain destruction. One death to a man is a serious thing: a dozen neutralize one another. I contented myself with determining the good Shermarkay to be the true Oriental hyperbolist.

With four mules and five camels laden with cotton cloth, Surat tobacco, rice, dates, various "notions," a few handsome tobes or sheets (intended as presents to chiefs) and necessities for the way, on the 27th November, 1854, El Haj Abdullah, attended by the governor, his son Mohammed, and a detachment of Arab soldiers, passed through the southern gate of Zayla, and took the way of the Desert.

There are two lines of road from Zayla to the ancient capital of the Hadiyah empire. The more direct numbers eight long stages through the Eesa territory, and two through the mountains of the Nola tribe of Gallas. In this country the "gedi" corresponds with the "hamlah" of Arabia: it is a stage varying from four to five hours. The camels are laden at dawn, and they proceed leisurely till about 10 A.M., when they are allowed to rest and feed. The march is resumed in the afternoon, and at nightfall the beasts and baggage are deposited in a thorn fence, which serves as a protection against lions and plunderers. I estimate the average progress to be 15 miles per diem; in places of danger

the Somal are capable of marching 27 or 28 without a halt; on the contrary, when water and pasture abound, they content themselves with a single short march. Shermarkay objected to my travelling by the direct route on account of the Eesa and the Gallas. These tribes inherit from their ancestors the horrible practice of mutilation. They seek the honour of murder, to use their own phrase, "as though it were gain," and will spear a pregnant woman in hopes that the unborn child may be a male. Then bearing with him his trophy, the hero returns home and places it before his wife, who stands at the entrance of her hut uttering shrill cries of joy and tauntingly vaunting the prowess of her man. The latter sticks in his tufty poll an ostrich feather, the medal of these regions, and is ever afterwards looked upon with admiration by his fellows.

The route which I pursued is by no means direct; its sole merit is that, after a march of about 50 miles through the Eesa territory, the merchant enters the lands of the Gudabursi Somal, amongst whom life is, comparatively speaking, safe. My compass bearings were as follow:—

1. From Zayla to Gudingaras	S.E. 165°	distance	19 miles.
2. From Gudingaras to Kuranyeli	145°	"	8 "
3. From Kuranyeli to Adad	225°	"	25 "
4. From Adad to Damal	205°	"	11 "
5. From Damal to Harmo	190°	"	11 "
6. From Harmo to Jiyaf	202°	"	10 "
7. From Jiyaf to Halimalah	192°	"	7 "
8. From Halimalah to Aububah	245°	"	20 "
9. From Aububah to Koralay	165°	"	25 "
10. From Koralay to Harar	260°	"	65 "

The distances give a total of about 202 miles. As regards the names of stations, it must be observed that the Somal, like the Bedouins of Arabia, the Todas of the Neilgherry hills, and other wild races, are profuse in nomenclature of every feature of ground. Each little watercourse, hill, dale, and plain, is distinguished by some descriptive term: "Adad," for instance, denotes the quantity of gum found upon the banks of the fiumara; Koralay (the "saddle-like") describes the peculiar appearance of a mass of rock.

To resume the narrative of my trip. Our little caravan, consisting of about twenty well-armed men and two women cooks, was led by one Raghe, a petty chief of the Eesa tribe. Shermarkay had constituted him our abban or protector; in return for food and sundry presents of cloth and "notions," he afforded us a safeguard in the hour of danger. The "Abbanat," as it is called, is an intricate subject; I may describe it generally as a primitive and truly African way of levying custom-house dues. Your "protector" constitutes himself lord of your life and property; without him you can neither buy nor sell; he regulates your marches, and supplies

you, for a consideration, with the necessaries of the road. In six days we traversed the maritime plain of Zayla; its breadth is from 45 to 48 miles. Along the shore all was desert, a saline flat warded with sand-heaps and bristling with a scanty salsolaceous vegetation. The sun singed as through a burning-glass, and the rare wells yielded a poor supply of bitter bilge-water. As we advanced inland, the country improved. Frequent *fiamaras*, or freshets, fringed with shrubs and thorn trees of the liveliest green, showed traces of the copious African monsoon. The ground was covered with a growth of yellow grass not unlike an English stubble; the kraals of the nomades appeared scattered over its surface; long lines of milch camels tossed their heads as they were being driven to pasture; numerous sheep, white as snow, flocked the plain; the beautiful little sand-antelope bounded over the bushes; and flights of vultures, unerring indicators of man's habitation in these lands, soared in the cloudless skies. Wherever we halted we were surrounded by wandering troops of Bedouins. The coarser sex is almost black and exceedingly plain, but tall and well made: their frizzly hair is dyed dun by a mixture of ashes and water, and its only Macassar is a coat of melted sheep's fat. The toilette is simple—a dirty cotton cloth covering the loins, leathern sandals, a round targe, a long dagger strapped round the waist, and two spears. The women are mostly habited in chocolate-coloured leather fringed at the border; their ornaments are zinc earrings, armlets of the same material, a necklace of beads, and a fillet of blue cloth worn only by matrons. The girls plait their wiry locks into numerous little pigtails, and the heads of the naked children are shaved in a galeated fashion, with a crest of curly hair.

By the power of my star, I escaped a large plundering-party of Habr Awal horsemen, who were sweeping the plain with malicious intentions. A few rifle bullets would doubtless have beaten them off; in this land, if you clear two saddles per cent., the remainder will surely run. But pilgrims and peaceful travellers should avoid using carnal weapons, especially if they intend progress in Eastern Africa. On the 3rd of December we arrived at the southern frontier of the Eesa tribe, under the hills which form the first step to the highlands of Ethiopia and fringe the Somali coast from Tajurrah to Jerd Hafun or Guardafui; their formation is successively limestone, sandstone, and granite in the higher regions. The air became sensibly cooler, and we remarked an increased degree of fertility, together with traces of a monsoon which lasts from June to September in the torrent beds and cataracts which seam the faces of the hills. When I traversed this country it was a desert, the cold having driven the nomades to the maritime plain, but thorn fences and rings dotted the slopes,

showing that in summer it is thickly inhabited. On the 7th December we threaded a *fumara*, the primitive zigzag of these lands, and stood upon the summit of the maritime chain.

From the 7th to the 23rd of December we traversed the country of the Gudabursi Somal, a large tribe, whose habitat is between the Eesa eastward and the Girhi to the W. Theirs is the rolling ground diversified with thorn-clad hill and fertile vale lying above the first zone of maritime mountain, and they have extended their lands by conquest towards Harar, being now bounded in that direction by the Marar prairie. These nomades, who are said to number 10,000 shields, are rich in camels and cows; their warlike reputation depends upon a few wretched ponies. They are more hospitable and docile than the Eesa, but their brighter qualities are obscured by knavery, thievishness, exceeding covetousness, and a habit of lying, wonderful even to the Eastern traveller. Some of the girls are not wanting in attractions. I gave to one of the prettiest a bead necklace, and she repaid me by opining that I was painted white. The savages, who take a delight in sight showing, insisted upon my visiting the Halimalah tree and the ruins of Aububah and Darbinyah Kolah. The former is a gigantic fig (*Ficus religiosa*), under which is performed the ceremony of binding the turban around the brow of each newly-elected Ūgáz or chief. The ruins, composed of rough stones,—the mud used for cement in these regions,—and bars of wood inserted as in Cashmir between the courses of masonry, are interesting, as they prove that the land has not been always barbarous. The only tradition preserved by the nomades is, that the fort of Kolah—so called from its queen—as well as Aububah belonged to the Gallas, once lords of the soil, and that their violent hostility ended in mutual destruction.

In the Harawwah valley I met with a notable disappointment as regards elephants. At Zayla they were represented to be plentiful as sheep; after beating the country nothing appeared but the last year's earths. The animals were still in the higher jungles, and we hastened to quit a place where it is impossible even to ride out without being covered with swarms of flies. The Tsetze of Southern Africa does not exist here; there is, however, a red variety called Diksi-As (red fly), whose bite, according to the natives, is so hot in summer that it causes violent vomitings. This, together with the fever produced by the mosquito-sting, is universally believed by the people; the traveller will receive the information *cum grano*.

On the 23rd of December I crossed the Ban Marar (Marar Prairie), a grassy tract not unlike our English downs, which separates the first from the second zone of hills. Its length is considerable; the breadth varies from 25 to 28 miles. The undu-

lating surface is covered at this season with a glaring yellow coat of dried up grass; about half-way we halted for an hour in a wady or fiumara, where my Somal employed themselves in eating the acacia gum. The place is infamous for razzias, and a small caravan, laden with hides and clarified butter to be bartered for maize and grain, had the honour (as the phrase of the country is) to sit under the shade of our sandals. Starting at 6 A.M., we arrived at 8 in the evening under the hills of Harar, with no other adventure than being dogged by a lion, who fled at the ring of a rifle. The cold was excessive, 42° in the hut at dawn, and in the noon-tide sun the mercury rose to 120° .

Though almost in sight of Harar, our advance was impeded by the African traveller's bane. The Gudabursi tribe was at enmity with the Girhi, and, in such cases, the custom is for your friends to detain you and for their enemies to bar your progress. Shermarkay had given me a letter to the Gerad Adan, chief of the Girhi; a family feud between him and his brother-in-law, our Gudabursi protector, rendered the latter chary of committing himself. We found ourselves forced to idleness until "Dahabo," one of the chief's six wives, and his eldest son Sherwa, visited our kraal for the purpose of escorting us onwards.

On the 27th of December we exchanged the rocks, thorn-trees, and dried grass of the desert for alpine scenery rendered by contrast truly delicious. We stood upon the portals of the highlands of Abyssinia, the huge primary chain which runs N. and S. along the length of Eastern Africa, and which—I hazard a conjecture—may have given rise to the theory of the "Lunatic Mountains." This range is broken into abrupt masses, often with table-formed summits; mountain rills of the purest crystal bubble down the ravines, a system of fissures in the pink granite, and, collecting into one broad shallow stream, flow towards the Webbe Shebayli. A species of fir (the Sinaubar of India, here called Dayyib) clothes the flanks and summits of the hills which are bared of earth by heavy rains; its presence in these lands usually denotes an altitude of 5000 feet. The valleys were yellow with corn and tawny crops of the gigantic "*Holcus Sorghum*;" it was "harvest-home" when the song of the reapers and the sound of the flail gave pleasant proof that we had left the land of Bedouins. The roads were thronged with peasants and market-people, and in the hedges the daisy, the thistle, and the sweet briar were so many mementos of an English home.

We remained six days under the roof of the Gerad Adan, one of the most treacherous and dangerous chiefs in this land of treachery and danger. My Somali attendants saw with horror that preparations were being made to enter the city of evil fame. They attempted by all means in their power to deter me from the

attempt, but the unfortunates little knew the persistency of a Haji. On the 2nd January, 1855, I mounted my mule, intending to enter Harar alone; the two policemen were shamed into accompanying me, and I left my third servant with the Gerad Adan, in charge of my heavy luggage and a letter of directions to be forwarded to Lieutenants Stroyan and Herne in case of accidents.

We passed on over the hills of Harar by roads so rugged that loads are shifted from camel to donkey back. As I approached the city men turned out of their villages to ask if that was the Turk who was going to his death? The question made me resolve to appear before the Emir in my own character, an Englishman. In these lands it is a point of honour not to conceal tribe or nation, and, as a general rule, the Ottoman is more hated and feared than the Frank. On the 3rd of January I entered Harar.

The ancient metropolis of the Hadiyah empire—now sadly decayed—is about 175 miles S.W. (220°) from Zayla and 219 S.W. (257°) from Berbera. This position, which I could ascertain only by dead reckoning, gives a latitude of $9^{\circ} 20'$ and a longitude of $42^{\circ} 17'$: it agrees nearly with the traditional site according to the following authorities:—

Lieutenant Cruttenden, I.N.	..	{	Lat. $9^{\circ} 22' 00''$ N.
		{	Lon. $42^{\circ} 35' 00''$ E.
Rev. Dr. Krapf	.. ..	{	Lat. $9^{\circ} 25' 00''$ N.
		{	Lon. $42^{\circ} 07' 00''$ E.
Captain Harris, Bo. A.	.. ..	{	Lat. $9^{\circ} 24' 00''$ N.
		{	Lon. $43^{\circ} 22' 00''$ E.

My thermometer showed an altitude of about 5500 feet.* The city lies upon the slope of a hill which falls from W. to E.: in the latter direction are plantations of bananas, citrons, limes, the coffee-tree, the kat—a theine plant well known in Arabia—wars or “bastard saffron,” and sugar-cane. Westward are gardens and orchards on a terraced slope; northward is a hill covered with tombs, and to the S. the city falls into a valley or ravine. It is about 1 mile long by half that breadth; the streets and alleys are like mountain roads; and the abodes, built of sandstone and granite cemented with a reddish clay, present a dingy appearance, strikingly different from the glaring whitewash of the East. The houses are flat-roofed, with small holes for windows and coarse wooden shutters; most of them have large court-yards and sepa-

* My thermometric observations were as follows:—

		Temperature,	Corrected altitude.
At Zayla and Berbera (sea-level)	..	210° .. 83° (and 86°)	.. feet.
Halimalah (hill top)	.. ..	204° .. 64°	.. 3347 ..
Agljosi (foot of Harar hills)	.. ..	201° .. 79°	.. 5133 ..
Wilensi (near Harar)	.. ..	200° .. 70°	.. 5656 ..

I have said that Harar is about 5500 feet above the level of the sea, as, for circumsppection's sake, the observation was made outside and at some distance from the city.

rate apartments for women, and almost all, even the Emir's palaces, are single-storied. There are some huts called "Gambisa," shaped like a bell-tent and peculiar to the cultivating Somal; they are equally common in Eastern and in Western Africa. The walls, ignorant of cannon, are defended by irregularly oval turrets whence spearmen and archers might annoy the enemy, and the five large gateways are full of guards armed with daggers and long staves. The climate appeared to me delightful—neither cold nor hot. Of eleven days we had three rainy; the air was fresh, and the sun not oppressive. The people assured me that their monsoon lasted six months, and this would account for the prodigious fertility of the soil.

The city owes its existence to the Emir Nur, who reigned about 316 years ago. In the days of Mohammed Gagne, the Attila of Eastern Africa, it was a mere collection of villages. The history of the place is a series of jihad or crusades against the pagau Gallas, and murder and sudden death of its petty princes. There are few public buildings: the bazár is a long street; the jami or cathedral mosque is a kind of barn decorated with two queer old minarets, built, it is said, by Turkish architects; and the palaces are single-storied houses with large courts, protected by doors of holcus stalks. The five gates are—

The Argob Bari	.. ..	Eastward.
Asum Bari	.. ..	N.
Asmadim Bari	.. ..	W.
Badro Bari	.. ..	S.
Sukutal Bari	.. ..	S.E.

Harar contains a population of about 10,000 souls, including about 2500 Somal, and not including a considerable number of Gallas and other Bedouins. Women abound, a circumstance arising from the prevalence of slavery. Harar is the great "half-way-house" for the produce of Efat, Gurague, and the Galla countries; slaves are driven thence to Berbera and exported by the subjects of H. H. the Imam of Muscat, in exchange for rice and dates. I did not judge favourably of the morals of the Harari. They drank freely—even in the presence of the Olema and pilgrims—hydromel and Farshu or Abyssinian beer. The Emir has been compelled to establish night patrols, who punish with the bastinado lovers and robbers. The men are peculiarly unprepossessing in appearance. Shaven heads, coarse features, and clumsy figures muffled in coarse tobes or sheets of dirty cotton cloth, with long thin staves in hand, frowned upon us with mischievous brows and occasionally addressed us with the roughest of voices. The pretty Abyssinian features of the women were novel to me, and their utter ignorance of bashfulness a surprise. The dress is a long cotton robe, indigo-dyed, with two

large inverted triangles of scarlet upon the chest and the shoulders : it is girt with a long zone of Harar manufacture. No veil is used, and sandals are at a discount. The hair, confined in blue muslin or network, is tied in two large bunches or balls below the ears, and the only ornaments are armlets of buffalo horn, coral necklaces, gilt hair pins, and Birmingham rings. Their voices are harsh, a phenomenon in Africa, where that organ is the only feature truly feminine ; they chew tobacco with effrontery, drink beer, and demean themselves accordingly.

Harar is celebrated for sanctity, erudition, and fanaticism. The Shaykhs Abadil, El Bekri, and Ao Rahmah bequeathed to it a reputation. Of modern celebrities the Kabir Khalil and Kabir Yunis rank foremost. None but the purely religious sciences are studied, books are scarce, and there is no such thing as the wakf or foundation for scholars, which makes men read in the East. Yet Harar sends forth a swarm of widad, *frères ignorans*, who, by the power of long prayer and chanting the Koran, live, as such folk mostly aspire to do, in plenty and indolence. Within the city a language is spoken quite different from the Somali and the Galla dialects ; like the former, however, it is partly Semitic in grammar and etymology, the Arabic scion being grafted upon an African stock. I collected a vocabulary and the grammatical forms which will afford the learned some idea of this still unknown tongue. The prevailing sound is the *ch* of the Scotch "loch," consequently the effect is harsh and unpleasant. Men of education always know Arabic, and the stranger hears in the streets Amharic, Galla, Somali, and Dankali.

The city is immediately surrounded by four tribes of Gallas, namely,—

The Nola to the E. and N.E.

The Alo on the W.

The Babuli Southwards.

The Jansa to the E. and S.E.

It is impossible to see this people without remarking its consanguinity to the Somal. These Gallas are Christian, Moslem, and Pagan adoring Wak (the Creator), all living together without religious animosity. They might annihilate the city in a day, but it is not their interest to do so. The Emir pays them from 600 to 700 tobes per annum ; they carry their lances into the palace-court, never run across H. H.'s gateway, as all others must do, and drink gratis strong drinks which they have not the art to brew. In return they are plundered by the citizens, and the Emir has made it penal to buy by weight and scale.

The Government may briefly be described as the Emir. This petty prince, whose signet bears the grandiose title of "Sultan son of Sultan," is by origin a Galla, by pretension a descendant

from the Caliph Abubekr. He is a beardless youth, 23 or 24 years old, short, thin, and apparently consumptive; his wrinkled brow and protruding eyes give him an appearance truly unprepossessing. Men say that he was poisoned by one of his wives; others declare that his ill health is the effect of a fall from his horse. He has four wives and two young children; during his three years' reign he has imprisoned a selection from his fifty cousins, and as, in this city, political offenders are buried in a dark dungeon, confinement and death are nearly synonymous. The Emir preserves all the dignity of empire. Those presented to him must kiss the back and the palm of his hand. He must not be stared at. When his cough affects him, an attendant presents the hem of his robe. Rosaries are not allowed at the *levée*, and those presented are dragged by the arms to the foot of the throne, a common Cutch couch. Running footmen precede the prince in the streets, flogging the people out of the way, and at mosque two or three matchlockmen stand over him, for he fears internal treachery as much as external violence. His wazir, the Gerad Mohammed, and his mother, the Gisti Fatimah, dare not address him without permission; he is, however, punctilious in administering justice. Imprisonment, fines, and the confiscation of property, punish political offences. Murderers are given up to the nearest of kin, and their throats are publicly cut with a butcher's knife. Petty offenders are beaten in front and rear by two executioners armed with large horsewhips. Usually, the Emir allows his subjects to seek the benefits of the religious law as propounded by the Cazi Abd el Rahman. They prefer, however, the prince's prompt decisions. Generally in the East a man expects to be defrauded by the civil power, but he is morally certain of being stripped by the ministers of religion.

Harar is an essentially commercial town. Three caravans yearly convey to Berbera the rich spoils of the Galla country; those of January and February are small, that which leaves in the month of March consists of at least 3000 souls and an equal number of camels. Ivory is a royal monopoly; the Emir buys it, and his subjects are forbidden to sell it. The best coffee comes from Jarjar, a Galla district about 7 days W. of Harar. The tobacs of this city are celebrated throughout Eastern Africa; handwoven, they far surpass the produce of our manufactures in beauty and durability. It is also the grand *dépôt* for the coffee, the wars-dye, the admirable cotton, the gums, the tobacco, and the grain of the Galla country. An idea of its cheapness may be formed from the fact that a dollar will purchase 120 fowls, and the same sum suffices to provide a man with bread for a year. The only coin is a bit of brass coarsely stamped; this "Mahallak" is the 66th part of a dollar, and the Emir imprisons all subjects who

pass or possess any other money. Nothing can be more simple than the system of taxation; the cultivators pay 10 per cent. taken in kind, and traders are charged 16 cubits of cotton cloth per donkey load; the consequence is that the animal is supported through the gates by four or five porters.

After sitting for an hour at the eastern gate, waiting the permission of the Emir to enter his walls, we were ordered by a grim guard to follow. Arrived at the prince's court-yard, we were told to dismount and run, as the subjects of H. H. must never cross the gateway or approach the palace but at a long trot. I obeyed the former and resisted the latter order. Then, leading our mules, we stood under a tree close to the state prison, whence resounded the ominous clank of fetters, and turned deaf ears to the eager questions of the crowd. It was a levée-day, and troops of Galla chieftains, known by their heavy spears and zinc armlets, passed in and out of the palace prolonging our anxious delay. At last, after being ordered to take off my slippers and to give up my weapons, a mandate to which I again objected, we were escorted by the grim guard to the palace-door. A curtain was raised. I entered with a loud salam, which was courteously returned by a small yellow man, not unlike an Indian Rajah, dressed in a conical turban and a red robe trimmed with white fur. As I advanced towards the throne, four or five chamberlains seizing my arms, according to custom, hurried me on till I bent over the Emir Ahmed bin Abubekr's extended fingers. Leading me back, they then seated me in front of the presence, while my two Somali attendants were kissing the palm and the back of the thin yellow hand. Looking around the room I remarked the significant decorations of its walls—bright fetters and rusty matchlocks. The courtiers stood in double file extended at right angles from the throne; all had their right arms and heads bared in token of respect, and whoever approached the Emir saluted his hand with exceeding reverence. At the end of my survey I was called upon by the wazir or prime minister, who sat upon a rug at the right of and below the throne, to answer a variety of questions concerning my name, nation, and business at Harar. The replies proving, it is presumed, satisfactory, I was invited to become the prince's guest during my ten days' residence, and received every day three dishes of bread and beef from his own kitchen. At subsequent visits I was admitted to the honour of a seat next to the wazir, and the Emir did not disdain to be indoctrinated with the principles of free trade in coffee and cotton. Slavery was a more delicate topic, and not being authorized to treat upon the subject officially, I contented myself with observing its operations and with preparing a scheme which will easily and surely remove this curse upon the

country's industry. During my residence at Harar, the two Somal who had been sent with me from Aden behaved admirably. As small-pox was raging in the town, I found an easy pretext for hurrying my departure. These African cities are all prisons on a large scale. "You enter at your own bidding—you leave at another's"—is the native proverb, true and significant. My speedy dismissal was perhaps owing to a report that three brothers had been sent by the Government of India to Eastern Africa. Visions of cutting off caravans induced the Emir to get rid of me, he being, it is said, much puzzled how to treat so uncommon a case. Yet I had no reason to complain of him; and as a proof that my modest endeavours to establish friendly relations were not unsuccessful, the Prince wrote, immediately after my departure to Aden, requesting to be furnished with a "Frank physician." He finally dismissed me with a mule for myself and a letter addressed to our Political Resident in Arabia.

I offer no description of my return route to Berbera, as it was a mere adventure of uncommon hardship. The accident which has for the present terminated our wanderings is deserving of some detail.

On Saturday, the 7th of April, the H. E. I. Company's schooner *Mahi* (Lieut. King commanding) entered the harbour of Berbera, where her guns roared forth a parting salute to the Somali expedition.

The great emporium of Eastern Africa was, at the time of my second landing, in a state of confusion. But a few hours before the Harar caravan had entered; and purchase, barter, and exchange were being carried on in the utmost hurry. All day and during the greater part of the night the town rang with the loud voices of buyers and sellers. To specify no other valuable articles of traffic, 500 slaves of both sexes were in the market.

On the 9th of April, about 3 p.m., a shower, accompanied by thunder and lightning, came up from the southern hills, where rain had already been falling for some days, and gave notice that the Gugi or Somali monsoon had begun. This was the signal for the Bedouins to leave Berbera: the mats were rapidly stripped off their frameworks of stick and pole, the camels were laden, and thousands of travellers poured out of the town. On the 15th it was wholly deserted; the last craft left the port, and our little party remained in undisputed possession of the place. We awaited the mid-April mail. In their utter security the Abbans or protectors accompanied their families and property to the highlands, leaving with us their sons as an escort. The people were decidedly friendly: the most learned of the Somal, the Shaykh Jami, whom I had met at Harar, called repeatedly upon us, ate with us,

and gave us abundant good advice concerning our future movements.

On the 18th April a small craft belonging to the port of Aynterad entered the deserted creek, and brought from Aden ten Somalis, who desired to accompany us southwards. We objected to taking more than four of these men: fortunately, however, I ordered our people to give dinner to the captain and crew of the craft. That evening we were visited by spies, who deceived not only us, but even their own countrymen: accordingly, the usual two sentries were posted for the night, and we all lay down to sleep.

Between 2 and 3 in the morning of the 19th inst. I was aroused by the cry that the enemy was upon us. My first impulse was to request Lieut. Herne to go out with his revolver in the direction of the attack; secondly, I called to Lieuts. Stroyan and Speke that they must arm and be ready; and thirdly, I sent my servant for my sabre. Meanwhile Lieut. Herne returned hurriedly from the rear of the tent, exclaiming that our twelve servants, armed with swords and muskets, had run, and that the enemy amounted to about 150 men. Lieut. Stroyan, who occupied another tent, did not appear: the other two officers and I were compelled to defend ourselves in our own with revolvers, which the darkness of the night rendered uncertain. Presently our fire being exhausted, and the enemy pressing on with spear and javelin, the position became untenable; the tent was nearly battered down by clubs, and had we been entangled in its folds, we should have been killed without the power of resistance. I gave the word for a rush, and sallied out with my sabre, closely followed by Lieut. Herne, with Lieut. Speke in the rear. The former was allowed to pass through the enemy with no severer injury than a few hard blows with a war-club. The latter was thrown down by a stone hurled at his chest and taken prisoner, a circumstance which we did not learn till afterwards. On leaving the tent I thought that I perceived the figure of the late Lieut. Stroyan lying upon the ground close to the camels. I was surrounded at the time by about a dozen of the enemy, whose clubs rattled upon me without mercy, and the strokes of my sabre were rendered uncertain by the energetic pushes of an attendant who thus hoped to save me. The blade was raised to cut him down: he cried out in dismay, and at that moment a Somali stepped forward, threw his spear so as to pierce my face, and retired before he could be punished. I then fell back for assistance, and the enemy feared pursuing us into the darkness. Many of our Somalis and servants were lurking about 100 yards from the fray, but nothing would persuade them to advance. The loss of blood causing me to feel faint, I was obliged to lie down, and, as dawn approached, the craft from Aynterad was seen apparently making sail out of the harbour.

With my little remaining strength I reached the spit at the head of the creek, was carried into the vessel, and persuaded the crew to arm themselves and repair to the scene of our disaster. Presently Lieut. Herne appeared, and closely following him Lieut. Speke, who had escaped from his captors, was supported in badly wounded. Lastly, the body of Lieut. Stroyan was brought on board, speared through the heart, with the mark of a lance piercing the abdomen, and a frightful gash apparent in the forehead. The lamented officer had ceased to exist; his body was stark and cold: we preserved his remains till the morning of the 20th instant, when we were compelled to commit them to the deep, Lieut. Herne reading the funeral service. We were overwhelmed with grief: we had lived together like brothers. Lieut. Stroyan was a universal favourite, and truly melancholy was the contrast between the hour when he lay down to rest full of life and spirits, and the ensuing morning when we saw him a livid corpse.

In conclusion, I must remark that a number of little combinations gave rise to our disaster. Our arrangements were hurriedly made. We could not take from Aden the number of well-trained Somali policemen upon which I had originally calculated, and we had to depend upon raw recruits, who fled at the first charge. But we had ever been led to believe that Berbera was as safe as Bombay itself, and we expected, after a month's march, that the men would be educated to fight. Political events at Aden also prevented our detaining the war-schooner Mahi, whose presence would have rendered the coast safe, and once in the interior we should have been secure from the Bedouins, who have a horror of firearms. Had our letters despatched from Aden arrived when expected, we should have been enabled to leave Berbera with the Ogadayn caravan.

Yet my opinion of the Somal is unchanged; nor would I assume the act of a band of brigands—for such was the cause of our disaster—to be the expression of a people's animus. They have learned to respect us: four or five of their number were, it is reported, killed or mortally wounded that fatal night; and if my plans for punishing the outrage be carried out, it will be long before a similar event occurs again. The officers whom I have had the honour to command profess themselves ready to renew the attempt; and when the ferment has subsided, we would start from Kurrum, a safer though a less interesting route. Should we be deterred by the loss of a single life, however valuable, from prosecuting plans now made public in Africa, we shall not rise in the estimation of the races around us. Briefly, permission to carry out our original projects is the sole recompense we hope for what we have suffered.

VI.—On the supposed Sources of the River Purus, one of the principal Tributaries of the Amazons.

By C. R. MARKHAM, Esq., F.R.G.S.

Read, March 12, 1855.

ON the 1st of May, 1853, I left the little town of Paucar-tambo, which is 40 miles N.E. from Cuzco, the ancient city of the Incas, with the intention of exploring and collecting information concerning the valleys to the eastward, and, if possible, penetrating to the banks of the Madre de Dios, or Purus.* From the level plains on the summits of the last range of the Andes, where the clouds, charged with particles of ice, roll along the ground, and snow covers the long grass, the road descends rapidly into the Montaña.† In less than half an hour the trees of tropical growth began to rise on either side of the steep zigzag path, the heat became oppressive, torrents of rain fell continuously, while, as the mists at intervals cleared away, hills became visible on every side, clothed with gigantic trees and tangled underwood.

After a journey down the steep path, of three hours' duration, I accomplished the descent, which was 8 miles long, and reached the banks of the torrent of Chiri-mayu, where a little shed had been erected. It was near sunset when I thus found myself at the entrance of the Montaña. The torrent, descending by a splendid waterfall at the side of the path, swept by the little level space where the shed was built, and disappeared almost immediately between the spurs of the hills. From the small amphitheatre thus formed, the hills rise up perpendicularly on every side, covered with tangled brushwood, ferns, and creepers of most brilliant colours; and wherever a projecting point gave room for roots to take hold, the space was occupied by lofty palms and other forest trees. The Chiri-mayu (or cold river) falls into the Tono, one of the tributaries of the Purus. Towards sunset it ceased raining, and the mists clearing away, a scene was presented of unequalled loveliness. The brilliant and varied colours of the foliage and flowers, the splendid butterflies of immense size, and birds of the gaudiest plumage, humming birds shaking the dew-drops from the scarlet salvias, parrots crowding on the upper branches of the trees, with the sparkling fall of the torrent, combined to form a fairy-like scene of surpassing beauty.

* "The passage into these valleys, where the coca grows, is over that high mountain called 'Camacny,' descending 5 leagues almost perpendicular, which makes a man's head giddy to look down: how much more labourious must it be to ascend and descend those ways, turning and winding in form of a serpent!"—*J. de la Vega*, b. iv. ch. xvi.

† The tropical valleys and plains to the eastward of the Peruvian Andes are called "*the Montaña*."

After trying in vain to light a fire, I ate some raw chocolate, and, wrapping myself in some mule-cloths, went to sleep. During the night a fearful storm of thunder and lightning burst over the spot, peal followed peal in quick succession, while again the rain fell in torrents.

Next morning, crossing a little bridge over the Chiri-mayu, I continued my journey down a ravine to the eastward, with steep hills rising on either side, and a river of considerable size formed by a junction of the Chiri-mayu and Yana-mayu (or black river), now called the Tono, dashing along at some distance below the path. For some leagues the way continued to lead down narrow ravines, the sides of which were covered with underwood. Tree ferns, palms, and enormous forest trees clothed the mountains up to their summits; masses of clouds rolled down the sides of the ravines, keeping the foliage continually wet; and here and there a beautiful cascade dashed foaming down into the Tono.

On a little level space, 7 miles from the hut on the Chiri-mayu, the forest had been cleared away, and the small farm of "La Cueva" established. Don Ramon Ordoñez, the proprietor, fearful of the inroads of the Chunchos Indians, had retreated from the vast plains farther E., and established himself in the ravine, whence escape to the mountains was easy. His property consisted only of a hut with two rooms, about a dozen Inca Indians from the neighbourhood of Cuzco, two fields of coca, and one of pine-apples.

About a league farther to the eastward the hills gradually sink lower, and at last merge into one vast plain covered with forest, which stretches away almost to the horizon. At this point the "Pitama" unites with the Tono, and forms one large river; and the path enters the plains or valleys of Paucar-tambo, leading through a dense and tangled forest, with the river Tono a few yards on the left-hand side.

Twenty miles through the forest, in an easterly direction, brings the traveller to the farm of San Miguel, the last settlement in this part of Peru—the extreme point to which civilisation has yet reached. The way leads through all the beautiful vegetation of the torrid zone. On either side grow the tallest and most graceful palms, tree ferns, balsam trees, India-rubber trees, and many others of enormous growth; while the underwood consists of creepers bearing flowers of every shape and colour, and thickets of bamboo, with their larger joints 6 inches in diameter, which in many places were broken, and hung across the road in dense masses, rendering it almost impassable.

Six small rivers * fall into the Tono, intersecting the road, and

* Malci-mayu, Luca-mayu, San Juan, Yanatey, Carachi-mayu, Uisiray.

the view up their courses, when crossing them, bordered by the tangled forest on either side, is very striking. The tall stately palms and spreading forest trees formed a dark vista, with the noisy streams dashing over the rocks at their feet, and numbers of birds of every size and colour flew to and fro, from the large wild turkey and green parrot to the brilliant little humming-bird. On the banks of one of these rivers I saw at a distance a great heavy tapir, standing partly in the water, and apparently meditating profoundly. Beyond the last of these tributaries the path ascends a steep cliff overhanging the river Tono, called the *Balcón-pata*, whence there is an extensive view, with the spurs of the Andes partly hidden in clouds to the westward, and a range of hills to the N.E., but in every other direction a dense forest stretched away to the horizon.

A mile farther on, travelling along rather higher ground, I reached the remains of the two farms of *Huayna-pata* and *Santa Cruz*.* The former was attacked a few years ago by the savage *Chunchos*, and every individual belonging to it was murdered; the latter has been deserted by its occupants, who dreaded a similar fate. Large neglected fields of coca, and plantations of cocoa and bananas, were rapidly becoming choked and overrun by the encroaching forest, and presented the melancholy spectacle of the retreat of civilisation before the returning tide of savage life. In a few years large trees will have grown up in every direction, and no traces will be left of these once flourishing estates.

A few miles to the eastward of this desolate scene is the farm of *San Miguel*,† which I reached in the evening of the 6th of May, 1853. *San Miguel*, one of the extreme outworks of civilisation in South America, consists of a number of huts forming three sides, and a long wooden building forming the fourth side of a square, which is planted with orange and citron trees. It is situated on high ground, comparatively free from mosquitos, near the banks of the river Tono, with a few fields of coca attached to it, but otherwise surrounded by the forest. The inhabitants consisted of the "Administrador," Don Pedro Gil, a native of Cuzco; a Piedmontese Carmelite friar, by name Bobo de Revello, who had been there about three years; and a few Indians from Cuzco. The long building forming one side of the square was the dwelling-house of Don Pedro and the friar. Its furniture consisted of a long table, rough benches, and bed places in the walls, like berths on board ship. They were living in a most wretched state of discomfort, without candles or any substitute for them, except two lumps of fat, used by the friar to say mass with; and their food

* Belonging formerly, the one to Don Bernardino Toledo, the other to Dr. Caseris, the priest of Sicani.

† Belonging to Don Anselmo Mellen.

consisted entirely of chuños, or potatoes soaked in water, and then pressed and frozen on the elevated plains of the Andes. They form, with a little fruit, the staple food of the people of these farms.

The soil in the valleys is so productive that four harvests of coca leaves are yielded annually, which sells at Cuzco for 4 or 5 dollars the arroba. San Miguel produces about 3000 arrobas * of coca a year, and a small quantity of cocoa and fruits, which are sent up periodically to Paucar-tambo on mules, and there sold. The outlay consists of the freight of mules at 3 dollars a journey, and the pay of the Indians 2 rials † a day, and when digging or clearing 3 rials. While working in the coca fields, they constantly keep one or two men armed with muskets as a security against a sudden attack of the Chunchos.

At San Miguel also there is an establishment for collecting India-rubber, belonging to Don Manuel Ugalde, an enterprising young Quiteño artist, living at Cuzco. It consists of eight or nine Indians, who go out weekly into the forests and search for the India-rubber tree. They usually return with several "ypas" or joints of bamboo, about 3 feet high and 4 inches in diameter, filled with the juice.

About a mile from San Miguel, and nearer the Tono, was the farm of Chaupi-mayu, ‡ in a ruinous and dilapidated condition, and probably by this time either deserted or destroyed by the Chunchos.

To the S., about 12 miles from San Miguel, near a river of the same name, is the farm of Cosni-pata, § the most flourishing of the three. It produces, besides coca, cocoa, and maize, about 120 quintals ¶ of rice, which sells at Cuzco for 3 dollars the arroba. This estate employs more labourers, and is altogether in a much more efficient condition, than the others.

These three estates of San Miguel, Chaupi-mayu, and Cosni-pata ¶ alone remain of all those which flourished in the time of Spanish power in the valleys of Paucar-tambo: one by one they have disappeared, either through the attacks and ravages of the Chunchos or the impoverishment of their owners, consequent on the continual disturbances in Peru since the independence; and a dense forest, the abode only of the savage jaguar, ounce, and peccary, and the still more savage Chunchos, covers with rank vegetation the once cultivated and fertile plains—a sad example of ruin and desolation consequent on the absence of a race of men

* 1 arroba = 25 lbs.

† 1 rial = sixpence.

‡ Belonging to Miss Ampuero; agent, Dr. Alvarez.

§ Belonging to Dr. Calderon of Cuzco.

¶ 1 quintal = 100 lbs.

¶ The three estates produce together about 8000 arrobas of coca yearly.

capable of successfully combating the difficulties of the country and the inroads of the wild Indians.

The Chunchos, or savage aborigines, of these valleys, lead a wandering life, and are thinly scattered over a wide extent of country. In the neighbourhood of the farms there are two tribes of them, one called the Huachipayris, inhabiting the banks of the river Cosni-pata, and the other the Tuyuneris, wandering along the banks of the Tono and Piña-piña. They are fierce, cruel, and untameable. Hating every stranger to the death, they wander about through the dense forest by tracks impassable and unknown to any one but themselves, perfectly naked, and armed with bows and arrows. Their arrows are of two kinds, one made of hard wood of the chonta-palm, and jagged like a saw, the other pointed with a piece of bamboo, which is very neatly secured to the shaft by a fine twine, and the feathers, fixed spirally into the arrow, are usually chosen from birds of the gaudiest plumage. Little more is known of the habits, and next to nothing of the language and religious ideas,* of these savages. They live, many families together, in a long hut, in shape like the roof of a house, and generally have a small plantation of bananas cleared away near it. Their food consists of bananas, birds, and fish, which they kill with their bows and arrows: the ypa, or joint of the bamboo, serving them as a utensil for all culinary purposes. They are also said to eat the monkeys which abound in the forests. The treatment of their women is said to be brutal and unfeeling, and almost induces a belief in the truth of those reports, which are current among many of the Indian tribes on the Amazons and its tributaries, concerning a race of female warriors who had fled from the tyranny of man.

Father Bobo de Revello has as yet been quite unsuccessful in his attempts to hold any communication with the Chunchos, and has therefore been forced to confine his sphere of usefulness to the inhabitants of the farms.

In 1850 he started on an expedition to discover the great river Purus. Crossing the Tono near San Miguel, the Crescenti, and the Piña-piña, large rivers which fall into the Tono, he ascended a range of hills, whence he had a glorious view of the great river of which he was in search, flowing on silently to the Amazons. Here his provisions failed him, having lived for some days on wild bananas, and he returned to San Miguel.

Father Revello, who is an enthusiastic explorer, has published a pamphlet called '*El brillante Porvenir del Cuzco*,'† in which

* They were said by the old Spanish chroniclers to worship jaguars and serpents.

† '*A glorious Future for Cuzco.*'

he shows that the great river he saw was identical with the Purus, and points out the splendid destiny which its navigation may some day open for Cuzco and the whole interior of Peru.

In June, 1852, another exploring expedition was equipped by the young men of Paucar-tambo, headed by Don Manuel Ugalde. They embarked on the river Tono, near San Miguel, in two India-rubber boats, and commenced its descent. The expedition, however, came to a sudden and premature conclusion; for at the point where the three great rivers of Tono, Piña-piña, and Cosni-pata unite, and form the Madre de Dios, the stream is very rapid, and the banks steep and rocky; and here, through some mismanagement, both the boats were capsized, and the inexperienced adventurers with difficulty escaped to the shore, abandoning all idea of continuing their voyage.

In the same year, Lieut. Gibbon, who, under the orders of Lieut. Herndon, was commissioned by the Government of the United States to explore the upper tributaries of the Amazon, penetrated into the valleys of Paucar-tambo and reached the banks of the Cosni-pata; but here, the difficulties opposed to his progress becoming insurmountable, he retraced his steps, and eventually descended the Beni and Madeira to the Amazons.

While at San Miguel I received much information concerning all that is known of these countries from Father Revello, and journeyed with him for some distance to the eastward of that farm. At a place about 2 miles from it, which he had called La Constancia, on the banks of a small tributary of the Tono, he had cleared away a space of ground and planted yucas and other vegetables. This was the scene of the last murder committed by the Chunchos, on a young monk from Cuzco, the companion of Revello. The latter had returned one evening in April, 1853, to San Miguel, leaving his companion at La Constancia. To his surprise the young man did not return that night, and the next morning Revello found his body pierced with nine arrows, one of them actually passing from one rib through his chest and out at the other side.*

These murders are of frequent occurrence, committed, apparently, out of mere wantonness, for the bodies are never robbed. Suddenly a shower of arrows flies from among the trees, and the wretched traveller or muleteer is transfixed, without even seeing his cruel and cowardly assailant.

I reached a hill beyond Constancia after a struggling and tedious journey through the dense forest, whence I obtained a view of the Madre de Dios; and this was the extreme point of my journey. The latitude I found to be $12^{\circ} 45'$ S., and the longitude

* These nine arrows were kindly given to me.

is about $70^{\circ} 30'$ W., 103 miles from Cuzco, and 740 from the mouth of the Purus. Near this point the Tono, with all its tributaries from the W., the Cosni-pata from the S.W., and the Piña-piña from the N., having drained the wide forests of Paucartambo, unite and form that mighty river which I saw from a distance, and which is here called the Madre de Dios, or Amarnu-mayu river, evidently the same as the Purus.

About 100 miles farther down, the Purus is supposed to receive as tributaries the two great rivers of Arasa or Marca-pata, and Ynambari; the latter draining the rich and extensive province of Carabaya, famous for its gold-washings, and for producing the best known quality of Peruvian bark.

Several facts tend to authorise the belief that the Purus has no great obstructions or rapids, as is the case with the Madeira and other tributaries of the Amazons; foremost of which may be urged its distance from the Andes on one side, and from the mountains of Brazil on the other, and the immense size of its tributaries.

The Purus empties itself into the Amazons by four mouths,* at a point where the visible breadth of that queen of rivers is nearly 3 leagues. These mouths are called, respectively, the Foro† de Camara, de San Thome, and de Cuinana; and the most easterly one, which is the principal mouth, Smythe judges to be $\frac{1}{2}$ a mile wide.‡ Here the French geographer Condamine, in 1745, sounded in 103 fathoms (no bottom); and Smythe found the depth of the Amazons about this point, and from Coari to Barra, to be 25 fathoms.§ The base of the delta of the Purus, or the distance from the most westerly to the most easterly mouth, is not less than 86 miles.

Such is a brief account of all that is known of this great river, the principal affluents of which, and the beautiful country through which they flow, I had the pleasure of exploring in the May of last year.

It is impossible to believe that the magnificent river system of South America is for ever destined to remain useless—the abode merely of the untamed savage and fierce jaguar. If once the Madre de Dios or Purus was thoroughly explored, the effects it would have on the industry and future prospects of Peru are incalculable. The people of the interior of that beautiful country,

* The smaller mouths are only navigable at high water in small canoes.

† Foro means a bar.

‡ Herndon gives the breadth at $\frac{3}{4}$ of a mile.

§ Herndon gives the depth, one mile up the river, at 18 fathoms, and at the mouth 16 fathoms; while the depth, at the same place, in the *Amazons*, was 23 fathoms. The current in the *Purus*, he says, was sluggish, running about $\frac{1}{2}$ of a mile per hour.—p. 265.

The shores of the mouth of the Purus are bold, and marked by bushes growing in the water.

the ancient empire of the Incas, would at length succeed in turning the granite barrier of the Andes; a port might be established near Paucar-tambo, and another at the mouth of the Purus; an inland navigation would waft the varied productions of the interior of Peru—its bark, sarsaparilla, copaiba, and India-rubber—its sugar, cocoa, cotton, and tobacco—its alpaca wool, silver, and precious stones—by a direct and easy route to the Old World, and the dangerous journeys across the Cordilleras and long and tedious voyages round Cape Horn would be avoided.

Already the enterprising spirits of the New World are turning their attention to this important subject. Treaties for the navigation of the Amazons, and the exploration of its affluents, have been entered into between the Governments of Peru and the Brazils; and a monopoly of the navigation has been granted, for thirty years, to an eminent Brazilian named De Souza, who already runs four steamers up and down the Amazons from Barra, near the mouths of the Purus, to Pará.*

NOTE.—Sixty years ago Haenke drew attention to the future importance of the Purus, the sources of which, from information derived from the Indians, he was then enabled to fix between the Cordillera of Vilcabamba and the east of the mountains of Carabaya—very much where Mr. Markham has laid them down.—See *Journal Royal Geographical Society*, Vol. V., p. 90. See also a paper by Lieut. Smyth, R.N., in Vol. VI. p. 11, &c., and one by Gen. Miller in the same volume, p. 174.—ED.

VII.—*Abstract of a Report made by Dr. R. A. PHILIPPI to the Government of Chile, of a Journey into the Desert of Atacama in 1853-54.*

Communicated by WILLIAM BOLLARBT, Esq., F.R.G.S.

Read, June 11th, 1855.

IN compliance with the Government decree of 10th November, 1853, confiding to me the exploration of the Desert of Atacama, I embarked in the schooner 'Janqueo' with M. Wm. Döll, my assistant, and two servants. We anchored on the 30th in the port of Caldera, whence I went to Copiapo, with the object of procuring all possible information about the Desert. The Intendente called together Messrs. Melendez, Tirapequi, Arango, and Almeida: the last had made the journey to Atacama some twenty-three years ago; he had formerly worked mines at various places on the coast, and had recently come from the Valley of Encantada, 60 leagues N. of Copiapo, and he decided upon accompanying us, although he was of an advanced age. The 7th December we

* The Government of Brazil guarantees him a bonus of \$100,000, which grant will probably prevent competition.

Sketch of a Route from
C U Z C O
 to the supposed Source of the
RIVER PURUS
 in duplicate a Paper
 by C. H. Markham Esq.





sailed for the port of Chañaral de las Animas, which must not be confounded with the port of Chañaral much more to the S., in 29° . Chañaral de las Animas consists of some twenty habitations and a population of 120 to 150 souls.* Here we commenced our investigations of the Desert by visiting the mines of Las Animas, 3 leagues from the coast, in a branch of the large and dry valley of Salado. The mines are of copper, and are numerous, 21 being at work at present. Copper is abundant, and new veins are continually being discovered. From these mines we went to the establishment of the Salado, and visited the Boquerona copper-mine, the only one now at work.

December 12.—Left Chañaral, and, at sunset, got to the watering-place of Cachinal de la Costa, situated in a narrow quebrada or ravine, very picturesque and covered then with vegetation.

The road from Cachinal to the Agua del Clerigo, in the Bay of Taltal, goes by the interior, and by places most miserable, arid, and stony, and entirely destitute of vegetation. We passed a night, without finding water or pasture, at our resting-place. Having arrived at the Agua del Clerigo, we had to rest our animals. This watering-place is 392 Spanish yards above the sea, at the foot of a great siemtic mountain.† We continued our journey the 16th December. The road descends to the coast to Hueso Parado, so called in consequence of the rib of a whale being placed there to mark the boundary. We passed the night at Estancia Vieja, where a little water gave nourishment to some pear-trees, a fig-tree, and an algarobo, and the next day we arrived at Paposo. Here we remained awaiting the arrival of our vessel the 'Janqueo.' We employed our time in examining the neighbouring mountains, where we found some vegetation. Don Diego Almeida remained behind in Paposo, as well as one of my servants, so I prepared to start with M. Döll and one servant. We left Paposo 22nd December, arriving the 27th at the mines of El Cobre, anciently worked by the Indians before the conquest. At this place, not mentioned in any chart, and in $24^{\circ} 17' 50''$, Don J. A. Moreno was working rich copper-mines, and gave us much information about the Desert.

From here to the N. the watering-places are scanty and vegetation entirely disappears, so it would have been most difficult to continue our journey by land. Every one who knew this terrible part of the desert dissuaded us from attempting it, telling us that a few weeks since there had arrived, almost dead, a deserter from the Peruvian troops of Cobija, and whose companion had died of thirst on the road. M. Döll, notwithstanding, wished to examine

* Chañaral in the Admiralty charts.—Ed.

† 363.5 English yards.—Ed.

the track as far as Agua Buena, and he went with the servant Nunez. He fortunately returned, after two days, more dead than alive; the tracks were terrible, no water was to be found, their animals gave out, and they had to journey great distances on foot.

Such being the state of things, I resolved to embark and examine the coast as far as the Bay of Mejillones, landing here and there. I omitted the landing-place (caleta) of Bolfin and that of Cerro Grande, or Monte Jorge, (in Fitz-Roy's chart these places are erroneously* called Punta Jara and Monte Jaron,) although I was informed that a person named Naranjo discovered a rich gold vein about here, the situation of which is not known now, in consequence of the unfortunate death of Naranjo, who having sailed from Coquimbo with the object of working this mine, was shipwrecked, and lost his life with the rest of his companions.

I landed in the Bay of the Chimba, which Captain Fitz-Roy calls Moreño Bay.† The Captain is in error, placing on his excellent chart a peninsula here instead of an island, and giving it the name of Bolfin; for the Farallones rocks are not where they are indicated by him. This island is called Isla Blanca, in consequence of being covered with guano.‡

We then went to Mejillones, where we found workmen collecting guano. Here, as in the Chimba, there is no vegetation whatever, and it is the most desert place imaginable. At some 600 yards above the sea, on the summits of the hills, a few quiscos (cacti) are found, which afford fuel to the guano collectors. As soon as the officers of the 'Janqueo' had finished the survey of the port, we sailed South.

The 6th January, 1854, we anchored at Paposo. I went on shore to give the requisite orders to my companions, and, whilst they were procuring mules, I went by sea to Taltal, where I landed my luggage and left the vessel, being now about to traverse the Desert of Atacama from this spot.

The coast from Caldera to the Chimba is composed of a continuous line of mountains, which go in a right line to Cobija and

* The error lies most probably in Dr. Philippi's want of local knowledge of the part, and he evidently mistakes his position, not having visited these places. See Admiralty Chart of the coast, and particularly the *plans*, on a large scale.

† Chimba Bay is that called in our charts "Constitucion Bay."

‡ Isla Blanca is called in our *Plan* "Forsyth Island." Bolfin is a peninsula in nearly the same latitude, but farther east, which probably led to Dr. Philippi's mistake.

Captain Fitz-Roy thinks that the Doctor visited Forsyth Island and Constitucion Bay, and finding them called "Isla Blanca" and "Chimba Bay," naturally enough accused the Charts. In coasting along by latitude and estimation, he seems to have passed by *Bolfin* peninsula. No part of the coast was much better explored by Messrs. Osborne, Forsyth, Davis, and Stewart, under Captain Fitz-Roy, than that about Morro Jorge, between Moreño Bay and that of Mejillones.—Ed.

still farther N.; however, that part of the coast between Mount Mejillones and Mount Moreno consists of an extended low, sandy plain, and, supposing that the sea rose 10 feet higher, it would become a perfect island. This escarped coast-range has a medium height of 650 to 700 Spanish yards, elevating itself occasionally to 1000 or 1300 yards. At times, at the base of the mountains, immense accumulations of disintegrated rock are met with; at others, large masses of rock are precipitated into the ocean. Few valleys cut through these mountains, and only towards the South are the following:—1. The great valley of the Salado, half a league N. of Chañaral. 2. The valley of Pan de Azucar, into which run the ravines of Juncal, Encantada, and Doña Inez. 3. The valley of Taltal, with the ravines of Chaco, Vaquillas, and Sandon.

There is no valley at Paposo, as is laid down in some maps.

The coast-line is very dangerous, having but few good landing-places, and the fishermen can only use the sealskin balsa. On the shores are large numbers of bones of the whale. Copper-ore is found in the mountains all along the coast. Independent of the copper-mines of the Animas, there are others at Agua del Clerigo, also near Paposo, in the valley of Matansilla, also at Vaca Muerta, 11 leagues N. of the Pan de Azucar. There are also copper-mines near Cobija.

Gold is not wanting in these coast mountains. I have seen pepitas of this metal in the copper-ore from the mines of J. A. Moreno, and a gold-mine has been worked, 7 leagues from the coast, in the valley of Taltal. A third locality is in Cerro Grande, or Cerro Jorge.

Silver has not been found in the chain of mountains near to the coast, but, 15 leagues in the interior, it has in several places. Don A. Asencio has worked a silver-mine near the watering-place of the Pueblo Hundido: the ore was a fine rosicler, but it soon ceased yielding. To the E. of the village of Carrizal there is a high mountain, in which J. A. Moreno discovered poor silver ore; and J. M. Zuleta has a silver-mine in Cerro Negro, 25 leagues from the coast and 10 leagues N. from Aguas Blancas; but as this locality is situated in the most arid portion of the Desert, and only gave 70 marks* the cajon, it would not pay working. I heard that platina had been found in the Desert, but could not learn its locality.

The vegetation of the coast is worthy of attention. The greater part of the year the sky is clouded, being clear in the months of February and March. The clouds are suspended at an elevation of 250 to 500 Spanish yards, and all the slopes of the mountains towards the W., which are covered by these clouds, afford a considerable

* The mark equal to 10 ounces.

quantity of vegetation; the summits above these levels are arid, as well as the great plain to the E. of the mountains of the coast, and which rises towards the interior. In this strip there are springs, and a little water which runs for a few paces, and is then lost in the disintegrated rock of the ravines. If it is easy to understand generally the origin of this vegetation, it is difficult to explain the various phenomena connected with it; and it would be necessary to obtain more meteorological observations of the coast, and, above all, continuous ones for every month in the year.

The indigenous population of the coast from Huasco to Cobija are called Changos. The men fish, the women tend small flocks of goats. This sort of life requires that they should frequently change their abodes as fish is scarce or plentiful, or as the desert pastures are abundant or not. They live in miserable huts formed of bones of the whale or cacti, covered with sealskins, rags, or seaweed; and as the occupation of the men is different from that of the women, they live but seldom together.

At times they suffer much for want of food. In winter, when the sea is rough and they cannot get sufficient fish, they hunt the guanaco, which animal at this season leaves the higher mountains and comes down to the coast; and in the dry season the goats have no other pasture than the *chagual* (species of *Pourretia*, R. A. P.) and the cacti: it is necessary to make a fire round these plants, so as to burn the spines, for without this precaution the goats could not feed on them.

At the commencement of the present century, when the hundred-weight of dried fish was worth 40 dollars in Valparaiso and 60 in Lima, this left a good profit; when these prices lowered the Changos became very poor, but at present they are doing better by working occasionally in the copper-mines of the coast. They all speak Spanish; even the old men have forgotten their native tongue. Thus at present the Changos are not to be distinguished from other Chilenos. They chew the coca leaf.

From the foregoing, it will be seen that there is not a village on the coast. Paposo has only one habitation, and a chapel, now closed. For a distance of 2 leagues N. and S. of Paposo there are scarcely a dozen huts. Pastures are very scarce indeed, water the same, being bad or salt. The establishment of the Salado is supplied with water from the Pueblo Hundido, a distance of 9 leagues, and in Chañaral fresh water is obtained by distilling that of the sea. Fuel is hardly to be had, and a stick is not to be found in the whole of the desert. The bushes are branching, and give out a strong heat; but any amount of population would soon use all up within its reach, and for the distillation of water or the smelting of metals fuel would have to be brought by sea.

There are three roads by which the Desert of Atacama can be traversed from the coast. The first, to the N., is from the watering-place of Miguel Diaz, or from the Cobre to the Agua of Filiposo, 25 leagues S. of San Pedro de Atacama. From the coast it is a 16 hours' road to the first water, or Aguas Blancas; here are two wells that afford water for a few animals only, but without any pasture. From Aguas Blancas 24 hours of road to water at Imilac, which is more abundant, with a little pasture. From Imilac 18 hours' road to Filiposo, where there is abundance of water and pasture. The second road is from Paposo to Antofogasta. The journeys are the following:—Paposo to Cachinal de la Sierra are 24 hours of road without water; to Sandon 9 hours; Rio Frio 7 hours. At Rio Frio the track crosses the "great road of the Desert" from Atacama to Copiapo; from Rio Frio to Antofogasta is 5 days' journey. The third road is from Chañaral de las Animas to the E., to Tres Puntas, or to the Cordillera. The first day, to the establishment of the Salado, is 7 leagues; the second day, to Pueblo Hundido, 9 leagues; to Chañaral Bajo, or the Farm, 9 leagues; here you enter the road from Atacama to Copiapo. The watering-places between the Farm of Chañaral and Antofogasta are, San Andres, Sierra Brava, Pasto Largo, Leoncito, Laguna Blanca, Colorada, Breas, Lorguasi, and the Diablo.

The direct road from Paposo to Cachinal de la Sierra not offering anything particular, I preferred continuing my journey from the Bay of Taltal to that place, because there were two watering-places on this track, that of Breas or Breadal, 6 leagues from the coast, and that of Cachiyuyal, at 10 leagues from Breadal, and 14 to 15 leagues from Cachinal. On this road we passed near to Cerro Colorado, which contains gold veins; these have been worked by Don Diego Almeida. Near Cachiyuyal, with other saline substances, there is much sulphate and carbonate of soda.

The road now rises, and Cachinal de la Sierra is at an elevation of 1575·9 metres (1889 Spanish yards), above the sea, and at night there was frost, even in the middle of summer. To the next water, Agua de Profetas, I found, for the first time, rocks of the secondary formation, clays with gypsum and rock-salt. Agua de Varas follows, with some pasture at an elevation of 3099·5 metres (3708 Spanish yards), and forms a natural division in the configuration of the desert. To this spot the country has in general an elevation from E. to W., traversed by dry beds of rivers running in the same direction. To the N. of Portezuelo of Varas the contrary is observed, a large basin running N. and S. 14 or 15 leagues to a ridge, but slightly elevated, which divides it from the great basin of Atacama. This basin is well closed in, and has no

outlet to the W. To the E. the ground is gradually elevated towards the high hilly land, where are elevated groups of insulated mountains, forming the summits of the high cordillera. The bottom of the basin has a large salt lake, the greater part dry and covered with salt pure and white as snow. On its margin are seen a few rushes and grass. Here are found also by digging in some places wells of fresh water in the midst of this salt: this appears very extraordinary! There is no other fuel except the dung of mules, and as the plants they feed upon are highly impregnated with various salts, this dung, instead of being reduced to ashes, leaves a sort of scoria when burnt, which is done with great difficulty. On this account it was not possible to boil water so as to observe the temperature, being the only way I had now to determine the altitude, for the aneroid would not move, and my barometer was broken. However, having been enabled to observe the elevation of the Portezuelo of Varas on my return, as well as that of Aguas Blancas (not the same Aguas Blancas which is between the coast and Imilac), another point in the vicinity, I do not think I am far out in placing this salt lake at an elevation of 2740 mètres (3277 Spanish yards) above the sea.

The road skirts this great salt deposit, which is called Punta Negra, from a resting-place on its margin. The next resting-place is Imilac, a little to the N. of the lake, in a small basin equally full of salt, where, as I have already mentioned, a road traverses direct from the coast. The road then takes a direction N.E., and, passing a broad mountainous country, containing thousands of small mountains composed of volcanic trachytic rocks, the traveller arrives, in 18 hours, at the great longitudinal valley of Atacama, and can rest at Filiposo, in a marsh covered with rushes and grass. This valley is about 2250 mètres (2690 Spanish yards) above the sea, and its bed filled by a salt lake like that of Punta Negra, but of 25 leagues in length, and 12 in breadth. To the E. of this lake the ground is elevated, and on it are many conical insulated mountains of about 6000 mètres (7180 Spanish yards). All look like volcanoes, and one of them, called Illaska, was giving out smoke from its summit. In 1848 it was in eruption: its fires have been seen at night, not only in Atacama, 20 to 25 leagues distant, but even as far as Calama, 40 leagues off, causing much consternation amongst the inhabitants. However, (it is said that) no ashes have fallen, neither has lava rolled out; but no one has taken note of any phenomena in such a desert, where habitations are many days distant from each other.

The road from Filiposo to Atacama runs along the eastern margin of the Great Salt Lake, at a short distance only over terrible sandy and stony tracks, and a burning blistering sun; for it was now nearly over our heads, the thermometer of Celsius rose

to 35° in the shade, and the two last days' journey between these places were the most painful we had suffered. Half a league or a league from the road are seen towards the E., and sloping, three green spots, the trees of Tilomonte (inhabited), Peine, and Tocado. A solitary algarobo is met with on the road, the first tree we had seen since we left Copiapo, and now is perceived at a great distance the extensively wooded country of Atacama; 7 leagues before arriving at this town, on the road side, is an open house, built for the use of travellers, called the Tambillo. I cannot describe the joy we experienced at these signs of being in the vicinity of human habitations.

We arrived at San Pedro de Atacama the 22nd January very much fatigued, after a journey of 13 days, and we rested until the 30th. We employed this time in visiting the rich mines of San Bartolo, 6 or 7 leagues N. of Atacama, which yield native copper and barrilla (rich cupriferous sand), similar to the mines of Corocoro in Bolivia.

San Pedro de Atacama is situated at the northern end of the Great Salt Lake, and at the southern extremity of the river of Atacama, which comes from the N.E., and, after running 16 leagues, begins to lose itself, being drained by canals of irrigation. Atacama is a straggling place, and it is only in the vicinity of the Plaza where there are any regular streets. The authorities could not give me with exactitude the amount of population, but I should say 5000 to 6000; the greater number are Indians, who speak a peculiar language, very harsh and guttural, but they understand Spanish. The principal persons are expatriated Argentinos. The Atacamans are generally employed in the transport of foreign goods from Cobija to the interior, principally to Salta, which province can be supplied much cheaper and quicker from Cobija, in the Pacific, than from Buenos Ayres.

The cultivation of grain is but trifling, as is also the rearing of cattle; the land yields principally alfa (luceru) and a few vegetables. The trees are algarobos, chañares, pear, and a few figs. The fruit of the algarobo and chañar are important items of food for horses and mules, and is also at times eaten by the inhabitants. Flour and meat come from the Argentine provinces. The Indians of the neighbouring towns bring meat of the llama. The guanaco is also eaten, and the inhabitants of Peine have no other animal food. European manufactures are not wanting, but the markets did not produce either milk, butter, fowls, eggs, potatoes, or vegetables during the eight days we were there.

We left Atacama the 30th January, not without some misgivings as to the favourable exit of our journey south, for we had been promised a person who should be a good *vaqueano* (guide) from Atacama to Copiapo; but when the day for starting arrived

no such guide was forthcoming, and I had to arrange with an old man who was recovering from a dangerous illness to accompany us for a few days. There are few persons in Atacama who know the road to Copiapo, and these few were now working in the mines of San Bartolo. We were consoled with the information that at Tocabado or Peine we should find guides. The first night we slept at Tocabado: here we hired a guide, but he did not make his appearance when wanted. In Peine all the men were absent, and the greater number of the women also. Nevertheless we had the good fortune to find one José Maria Chaile, who offered to accompany us to Rio Frio and conduct us to the spot where the meteoric iron is met with, also to the Sulphur Mountain on the road from Paposo to Antofagasta, for a gratification of 5*l*.

At first we took the same road we had come, but at 9 or 10 leagues to the south of Filiposo the road to Copiapo diverges and takes a more southern direction. The road is some 45 to 50 leagues from the coast, and goes over the great (loma) ridge already spoken of, with its insulated groups of mountains, a ridge the general elevation of which is about 3300 metres (3950 Spanish yards), but in parts even 4000 metres (4800 Spanish yards). These elevations are nearly destitute of vegetation, very rocky, and exposed to violent winds from the W. during the day, and are very cold, whilst at night the *Terral*, or land-breeze from the E., blows gently, although much colder. During the day's journey four, five, or more ravines are crossed, from 150 to 250 yards deep, or even more, the steep slopes of which fatigue both man and beast, especially with the Puna (rarefied state of the air) that reigns in this region. All the ravines run E. and W., and are lost in the basin of Punta Negra, or more to the S. in the great declination between the high Cordillera and the mountains of the coast. The greater number are dry and without vegetation, but the watering places, distant from each other 5 to 12 leagues, are always at the bottom of the ravines.

The watering-place of Puquios, the first after Filiposo, is 17 leagues distant, one well with but little water, and the pasture scanty. The second water is Pajonal: here is a small stream which runs for nearly a quarter of a league before it is lost, and has a little pasture. Between these watering-places the Alto del Puquio is passed, which cannot have a less elevation than 4800 varas (14,400 feet), and contains veins of copper and argentiferous lead ore.

We employed one day to visit from the Pajonal the locality where the meteoric iron is found, mentioned in all mineralogical works; the exact spot is situated 1 league from the watering-place of Imilac (Imilac is in $23^{\circ} 49' \text{ S.}$, $69^{\circ} 14' \text{ W.}$), and if Don Diego Almeyda or our muleteer had known of this interesting

spot, we might have visited it when we came from Paposo to Atacama. Our guide, José Maria Chaile, and another had discovered this iron some 30 or 40 years since; the large pieces are already taken away, but we found still several small masses, and these probably are more interesting than the larger ones, for they clearly show that when the iron fell from the atmosphere, it was in a complete state of fusion, and as if raining drops of iron.* This night our guide declined going any farther, and what would have become of us I know not if we had not fallen in with a man named Trites, of Tres Puntas, who was on a cateo (mine hunting) in the desert, and who had the intention to accompany a friend who was going to Atacama. He, seeing that we could give him a mule, resolved to accompany us.

The next watering-place after Pajonal is Zorras, the only place on this road where there is sufficient pasture. There is running water in the ravine of Zorras for more than 3 leagues, with good grama grass.

We had been told that half an hour from this resting place we should arrive at the foot of the mountain of Llullaillaco, the most elevated point in the Cordillera between Copiapo and Atacama, also interesting, as it is said that sulphur is found here. In consequence of this information Mr. Döll accompanied me on foot up the ravine. Having journeyed some 3 leagues it widened, and its sides had easier slopes; we ascended one of these slopes and found ourselves on a plain 3 or 4 leagues from this gigantic mountain, which is not exceeded by the elevation of Chimborazo; it was now mid-day, and we returned. It is incredible how one is deceived by distances in this thin and dry air.

From Zorras there are 10 good hours' journey to Barrancas Blancas, or Aguas Blancas (which is not to be confounded with the Aguas Blancas between the coast and Imilac), situated a little to the S.E. of the Lake of Punta Negra, and where there is only slight pasture. The valley, or rather basin in which the above lake is, continues to the S., but elevating itself gradually, and in a ravine runs the stream of Rio Frio, which has water for 2 leagues and pasture. Considering the general formation of this part of the country, it may be said that in its extension from the head of the river of Atacama to the springs of Rio Frio, a distance of 100 leagues, it is one large longitudinal valley, although interrupted and divided into several parts. This Rio Frio takes its name very properly for the resting place, which is at 3527 mètres (4219 Spanish varas) above the sea; and in the mornings, the

* See Vol. XXI. Journal Royal Geographical Society, 1851, Observations on South Peru and Atacama; also Paper read to the Society on the Meteoric Iron of Atacama, by W. Bollert, June, 1855.

middle of February, the Centigrade thermometer marked 7° below zero.

The road continues rising to the Portezuelo de Vaquillas, which I suppose to be 4200 metres (5000 Spanish varas). We did not follow the road to Vaquillas, but turned a little to the right ere we got to the Portezuelo and descended rapidly into the valley of Sandon, where we rested, finding water and pasture. The next day's journey conducted us to the water of Chaco, where we found the whole bed of the valley covered with carbonate of soda, mixed with common salt. On the slopes of the ravine I found many fossil shells, principally *Ammonites* and *Posidonia*. Here pasture is found, but as this spot is so retired, more than 70 leagues from Copiapo, 90 from Atacama, and 45 from the coast, it is not probable that this salt would pay the working of it. The next water is Juncal; has but little pasture. Then comes the deep ravine of Encantada, and as there was abundance of pasture here we remained a day, so that our animals might get a good feed. The next water is Doña Inez and a little pasture, but nearly all consumed by the animals of those who come into the Desert to catear or hunt for mines. In *Pasto Cerrado*, which follows, there is much rush, brea, and grama grass; but as the water was very bad we went 1½ league farther, to *Agua Dulce*, the only pasture there being brea and carriza, plants in no way suited to give strength to animals.

The next day we arrived at Chañaral Bajo, also known as the farm of Chañaral, a beautiful oasis in the Desert, where in a narrow valley are seen fine willow trees, algarobos, chañares, figs, vines, melons, and vegetables. I observed that the walnuts and peaches did not thrive, owing to the late frosts of spring. This place appeared to us a terrestrial paradise, as well as to all those, like unto us, who for 24 days had not seen a tree, nor anything green, for the plants of the Desert are all yellow or brown. I continued my journey, and a march of 8 hours brought us to *Tres Puntas*, where the animals arrived so worn out that their loads, now very light, I had to put into carts and let the poor beasts go free to Copiapo, where we arrived on the 27th February by the railroad, which passes the watering-places of Puquios and Chulo, thus ending my journey into the Desert of Atacama.

I will now advert to the riches of the Desert. There can be no doubt that various metallic matters exist. Near the town of Atacama gold was found, but for want of water a lavadero or gold washing has not been established; near Peine are silver veins, but the ore is poor. I have already spoken of the argentiferous lead ore in the heights of Puquios, and I have seen silver specimens from the Alto del Pajonal; la Encantada shows indications of copper and silver; the mountain of Indio Muerto, between

Doña Inez and Pasto Cerrado, is full of holes, where parties have been searching for mines. Many of these mines would pay if they were in other situations, or near to populations, or if the ores could be easily transported to the coast. I do not deny that there exist in the Desert veins of metal as rich as those of Copiapo, but I do not at the same time speak as to the absolute certainty. The farm of Chañaral is an example of such in the Desert, but in these localities one cannot calculate for two years together on crops; then the great rains that occur in the mountains about every 10 or 20 years threaten at such times to cover these farms of irrigation with immense alluvial deposits.

Having returned to Santiago, Mr. Engelhard of Copiapo communicated to me that, at the distance of 2 or 3 leagues from the Aguada de Puquios (to the S. of Tres Puntas), are found indications of coal in the ravine of Ternera. I must not omit saying a few words about the famous road of the Incas. This road was made by the Incas of Peru, after having conquered the northern part of Chile, and it can be seen from Atacama to Copiapo. It has generally followed a straight line, but seldom passes a watering place. When we first crossed between Imilac and Filiposo we did not see it, it being so indistinct; and it appears to me that in making this road, all that has been done has been to pick the stones say $1\frac{1}{2}$ yard off the ground, putting them on each side. On the sides of this road are ruins of habitations (pircas) which have served for those who had to make the road.

We remained in the Desert 87 days, from the time we disembarked in Chañaral until our arrival in Copiapo. If we consider as boundaries of the Desert, San Pedro de Atacama in the N. and the valley of Copiapo in the S., its length is of 4°, or 108 leagues in a right line—an extension say from Madrid to Lisbon or Gibraltar, or as Venice from Naples; the width of the Desert from the coast to the divisional line of waters in the Andes is about 55 to 60 leagues; thus its superficial extent is 5900 to 6480 square leagues.

The Desert of Atacama is of greater extent than that of many European kingdoms, and unpopulated, excepting Chañaral de la Costa, Tres Puntas, and the huts between Tres Puntas and Copiapo, and a few on the coast; and if we see in certain maps towns with the names of Chaco Alto, Chaco Bajo, Juncal Alto, Juncal Bajo, such have been placed at the fancy of map makers. The only inhabitants are guanacos, vicuñas, viscachas, a species of mouse called *ocultas*, small doves, small partridges of the cordillera, and lizards. The vegetation, although very scanty, may have some new plants.

The surface of the Desert consists, with few exceptions, of enormous piles of stones, gravel, and angular pieces of stone, so sharp that the guanaco hunters have to put hide shoes upon the feet of their dogs, to save them from being wounded. More fre-

quently are seen sandy tracks, and others of a marly character. I did not observe continuous ridges of mountains, but isolated groups planted on elevated land; the mountains are round, or slightly conical, and generally consist of heaps of broken stones. It is rarely that picturesque or huge rocks present themselves, and in general it may be said that the whole Desert is very monotonous. Volcanic productions are frequently seen, but I will not enter further into details, for the examination of the productions of the Desert will form the substance of communications to the University of Santiago.

The climate, as a matter of course, offers many variations, according to the situation of the various localities. I have already mentioned that in the summer months there is a strong wind during the day from the W., which is cold at great elevations, and it blew with such violence at times that we could not put up our tent. At night the *Terral* or land breeze from the E. blows but mildly; it is however penetrating and freezing, because it descends from the Andes. In the basin of Punta Negra, and that of Atacama, the heat of the day is very great, notwithstanding their elevation above the sea, because the soil, which is dry, arid, and stony, is heated strongly by the sun's rays, and because there is, as in all deserts, no shade: thus, to observe the temperature during the day, we had no other shade than under the belly of the mule, the sun being then nearly perpendicular. A consequence of the rarity and dryness of the air is the great cold felt at night, caused by the radiation, so that at many of our resting places the thermometer was below zero in the morning ere the sun rose. In Rio Frio the thermometer at 5 A.M. was at 7° C. below zero, and in the hottest hours of the day did not exceed 19° C., whilst in Atacama it showed 11·2 C. at 6 A.M., and 27° C. at 1 P.M.

The dryness and extraordinary scarcity of rain in this desert portion of the globe is, without doubt, the cause of its sterility. In the town of Atacama sometimes it does not rain for 18 months, and even in the Andes the rains and snows are rare. In the month of February moisture is precipitated occasionally, and we experienced three slight falls of hail, and even snow. For this reason there are so few summits covered with snow. The line of perpetual snow may be about 4,500 to 4,800 mètres (5,380 to 5,770 varas = about 17,310 feet). Every 10 or 20 years heavy rains occur, which produce in each ravine a deluge, the effects of which are most clearly seen in the rubble and stuff forming the slopes of the valleys. The last rains were in the month of May, in 1848, when the Salado river ran into the sea.

I have heard much said as to the great electrical state of the air of the Desert. We experienced nothing in particular, excepting that every night there was much lightning in the Cordillera, principally between Filiposo and Rio Frio, and generally without thunder. The mirage is very common, and seen daily. We col-

lected 5 skins of quadrupeds, 5 heads of same, 73 bird skins, 25 reptiles, 300 insects, 95 molluscas, 387 species of plants, seeds of 125 to 150 species of plants, a small number of bulbs, potatoes, and live plants (*quiscos-cacti*), 200 specimens of rocks, shells, &c. Mr. Döll is occupied in the construction of the Map of the Desert.*

1. *Itinerary along the coast of the Pacific to the port of Cobija.*

	Leagues.
Chañaral de las Animas to Cachinal de la Costa	11
Cachiyuyal; no pasture or water	10
Agua del Clerigo, Hueso Parado or Tartal	13
Estancia Vieja	7 or 8
Paposo.	
Agua del Panal	6
Botijas	6
The Agua of Miguel Diaz is between the two latter points.	
Cobre.	
Agua Buena	10
Agua de la Chimba	12
Agua Morena	3
Chacalla	9
Tames	14
Cobija	7

2. *Itinerary from Paposo to San Pedro de Atacama.*

	Leagues.
Paposo to Cachinal de la Sierra ..	28
Agua de Profetas	9
Agua de Varas	4
Punta Negra	7½
Imilac; meteoric iron found here	11½
Pingo-pingo; no water	2½
Filiposo	8

	Leagues.
Agua de Caravajal	14 or 15
San Pedro de Atacama	12½
Another road goes from Punta Negra by Zorras, Pajonal, and Puquios to Filiposo.	

3. *Itinerary from Atacama to Copiapo.*

	Leagues.
San Pedro de Atacama to Agua de Caravajal	12½
Filiposo	14 or 15
Puquios	15
Pajonal	6
Zorras	7½
Agua Blanca	11½
Rio Frio	9
Sandon	7
Vaquillas	4½
Chaco	3½
Juncal	7½
Eucantada	6½
Dofia Iner	7
Agua Dulce	10½
Chañaral Bajo	12
Another road goes from Agua Dulce.	
Chañaral Alto	8
Chañaral Bajo, or the Fama ..	6
Tres Puntas	7
Puquios	7
Chulo	7
Copiapo town	6

Note.—Professor Domeyko, of the University of Santiago, who was most obliging to me during my stay in the capital, gave me the following analysis of the Meteoric Iron of Imilac:—Iron 88·54, Nickel 8·24, Cobalt 1·14, Silica 0·16; and he thinks that the Silica exists here as Silicium. The Professor gives the following analyses of the Olivine from the Volcan of Antuco (Chile) and that of the Atacama Meteorite:—

	V. Antuco.	Atacama Meteorite.
Silica	0·400	0·407
Magnesia	0·476	0·397
Protoxide Iron	0·133	0·196

We see by the foregoing that one position at least, that of Imilac, has been visited and reported upon by scientific men.

Dr. Turner's analysis of the iron said to be found at Tocanado is,—Iron, 93·400; Nickel, 6·618; Cobalt, 0·535. Doubtless the specimens sent by Dr. Reid to Munich will be examined.—WM. BOLLAND, F.R.G.S.

* A copy of this map has been received from Dr. Philippi.—Ed.

VIII.—*Observations on the Coal Formation in Chile, S. America.*

By WILLIAM BOLLAERT, Esq., F.R.G.S.

Read, June 11, 1855.

SPANISH and some old foreign writers mention the existence of coal as occurring on the coast as well as in the interior of Chile. During the period of the Spanish occupation of the country, for all purposes in which fuel was required, wood or charcoal was resorted to. Since the great political changes and separation of the colonies from Spain, and their formation into independent governments, with the influx of foreigners with their trade and arts, Chile in particular has commenced being a manufacturing country; a very important branch is that of copper-smelting, in which the native coal is now being used; the steamers are supplied with it, also iron and other foundries, and it is used for domestic purposes and exportation.

As various opinions have been expressed as to the character of Chile-coal, I propose in the following remarks to consider the subject in its several bearings.

In 1825-7, whilst residing in Peru, I saw the Talcahuano coal used in the forge; it was very light, friable, sulphurous, but slightly bituminous, and so inferior that it was thrown aside;* it was more of a lignite than coal, and little hope was then entertained that a useful article could be extracted from the coal beds of Talcahuano or its vicinity.

In 1828, in company with Mr. George Smith of Iquique, in a survey of the island Quiriquina, in the bay of Concepcion, we found indications of carbonaceous matter, such as was met with at Talcahuano, also at Lirquen in the same bay; but from its peculiar character, and the soft sandstones accompanying it, our impression was, that we could only refer it to a lignite formation, or at most to that of a very imperfect coal, and it did not appear to us that by following the seam, an article of much better quality would be obtained.† Darwin, who visited Chile 1832-36, is the first who has given us any idea of the geology of the country, and when adverting to that of the coast, indicates granites, schists, sandstones, lignite, &c., and imperfect coals, and states that the coal-formation from Chiloe to Concepcion is a very ancient tertiary one. The fact, however, of there being imperfect coal in the country, caused the mines of Talcahuano and Lirquen to be worked, and search to be made in a southern direction, when the bay of Coronel was examined;‡ and as coal was then particularly

* Surface and weatherworn coal.

† So thought Darwin in 1835.

‡ Coal was found here and mentioned by Capt. Fitz-Roy in 1835. See *Voyages, Adventures, &c., of Beagle*, vol. ii.

required for copper-smelting, it was found there of a better quality and in abundance, and the neighbouring district of Lota was also discovered to contain coal.

In the year 1840 the coal of the Morro Hill* at Talcahuano was examined by Mr. Wheelwright and Mr. Peacock, the superintendents of the Pacific Steam Navigation Company; and after several trials had been made with specimens from this spot under the boilers of the steamer 'Peru,' it was found to give abundance of steam, although yielding a large amount of residuum, and about 20 per cent. greater consumption than the best Welsh coals, requiring consequently more space in the ship and greater labour in working. These gentlemen, however, being thrown upon their own resources by the non-arrival of coal from England, continued their researches, and commenced the working of the mines in earnest, by driving levels and sinking pits in the hill of the Morro, and actually worked out 30,000 tons, which was all burnt on board the steamers 'Peru' and 'Chile' during their voyages up and down the coast. Mr. Peacock, with the aid of a ship's blacksmith, managed to construct a boring-rod, and by boring in the plain at the back of the Morro, he discovered a seam of superior coal at the depth of 130 feet below the level of the sea, where he sunk a pit 9 feet in diameter, bringing up the water by means of a jack-roll and buckets; but in the absence of a pumping-engine (not to be obtained on the coast at that time) it gained on the sinkers just as the seam was won, and the pit was filled with water.

About this time large shipments of guano were being made from Peru, and the freight of English coal being reduced to 20s. per ton, it was found cheaper to use English coal, and the works were not prosecuted. The increase of steamers on the coast for the last three years caused a larger demand, and the seam at Lota was at once opened, and is now being worked to a great extent: it was worked, as was Coronel, by means of levels, but which method is now being abandoned, particularly at Lota, for that of working by pits. Some two years since the Lota Coal Company was established, and the operations are now carried on under the management of M. B. Whyte, Esq., according to the English mode of working, but steam-engines will shortly supersede the use of oxen at the whims; and as the requirements of coal are rapidly increasing, Lota—not long since part of the wilderness road to Arauco—will be a flourishing locality.

My own impression in regard to Chile coal, when previously in the country, was, that it was a lignite, or at most, a very imperfect coal; however, on arriving at Iquique, in Peru, 1854, and examining the fuel from Coronel and Lota, and seeing it used with ad-

* Lord Cochrane, Captain Basil Hall, and others used the Concepcion coal.

vantage at the nitrate of soda refineries of Tarapaca, I was obliged to confess that there was a coal-formation in Chile.

Having occasion to go to Valparaiso on the 3rd of June, I took passage in the steamer 'New Granada,' on board of which vessel I had the opportunity of observing the practical application of Lota coal to steaming purposes. The chief engineer, Mr. Henderson, informed me that it was now more than twelve months since he had used this coal: the first two voyages the ship was deficient in steam, on account of their not being acquainted with the burning of the coal, and furnaces not being properly adapted to its use; but a little alteration being made in them, by giving more air and less draught, there has not been the slightest difficulty in using Lota coal, and that the difference of consumption is somewhat more than good Welsh coal. The engineer stated that it is said to be liable to spontaneous combustion, but that in his experience he has not seen the slightest tendency to do so.

The following embraces a most important item regarding this coal in a pecuniary point of view:—

The 'New Granada' consumed 15 tons Welsh coal per day, value 18 dolls. per ton, equal to 270 dolls. per day; this same steamer consumes 18 tons of Lota coal at 6 dolls. per ton, which is a saving of 18,360 dolls. per annum, or 3,670*l*.

From a communication written on board the steamer 'Yankee Blade,' between Valparaiso and Panamá, dated April 12th, 1854, the following is extracted:—

"The quality of the Lota coal is excellent, and superior to that hitherto found in Chile; it is a rich bituminous article. As to the facilities of loading, the 'Yankee Blade' took in 700 tons in 3 days. Lota is a port of entry, allowing vessels in ballast to enter there direct from foreign ports. The steamer 'America' made, with Lota coal, her voyage from Valparaiso to Panamá in less than 10 days; the last 24 hours the 'Yankee Blade' ran 277 miles, and the difference between the Lota and Cardiff coal was only 5 per cent. in favour of Cardiff."

I landed at Lota the 6th of June (Lutrin Point, lat. 37° 4' 10" S., long. 73° 16' 5" W.). The port is good, and protected from "Northerers." There was great activity observed in raising the coal from the pits; it is screened at the pit mouth, bagged and weighed, carted to the beach, put into launches, and by these taken on board. The present settlement is along the summit of the hills, containing a population of more than 600 labourers, some being Scotch coal miners. I examined the surface of the country, which is undulating land and ravines; on the sea-shore are observed indurated sandstones and conglomerates, and in places the coal seams cropping out. The geological formation is, as Darwin states, an old tertiary; continuing easterly the

valley of Lota is attained, and the coal-formation appears to extend some little distance inland, where it is seen to rest on schistose rocks of the Colcura range. There are deep valleys farther to the E., and I was informed that the sandstone formation of the coast is there also; a rich vegetable mould covers the face of the country; pastures are in abundance as well as timber, and the climate is most healthy. I visited the neighbouring district of Coronel, where there are levels and pits some 30 in number. I descended the Lota pit, passing various seams of sandstones, clay, fire-clay, and at 40 yards came to the working coal seam. The declination of the strata is about 1 in 10 to W.N.W.; the coal seam a little more than 4 feet thick. It looked well developed, comparatively hard, and generally clean. In some positions there are troubles and up and down throws, but no fire or choke damp. The largest section of this coal-field is from the No. 5 boring in Lottilla valley. It is one of 80 yards 11 inches, composed of 35 different layers from surface, the 16th being the first coal seam of 4 feet 1 inch; the 34th layer is the second coal seam of same thickness as the first. This carbonaceous deposit has been described by practical persons as a good bituminous coal, in which I entirely concur; and I have been somewhat tardy in coming to this conclusion, on account of the impression the lignitiferous coal of Talcahuano made upon me in former times.

The Admiralty Investigation Committee gives the following analyses of the lignite of Talcahuano:—ash 6·92, carbon 70·71, hydrogen 6·44, oxygen, sulphur, nitrogen 16·93 = 100. Dr. Playfair's analysis of Colcura coal, identical with the outcrop at Lota:—ash 5·68, carbon 78·30, hydrogen 5·30, oxygen 8·37, sulphur 1·06, nitrogen 1·09 = 100. Mr. Abel of Coquimbo gives the following recent analysis of Lota first seam:—ash 2·05, carbon 83·70, hydrogen 1·02, oxygen and nitrogen 13·23 = 100, and he remarks that the Lota coal is equal in quality to many of the best English coals. Its specific gravity is 1·300.

It has been shown that this old tertiary formation is of great extent, particularly along the coast. Coal has been found in the Straits of Magellan, and indications of it only 30 miles S. of Valparaiso, and there is reason to believe that coal may be met with to the E. of the coast ranges in the south.

The Lota coal district is estimated to contain about 40 million tons of coals; Coronel, double that quantity. The shaly strata above and below the coal, contain impressions in abundance of a large leafy plant, bunches of stuff like burnt straw, and indications of calamites and pines.

Valparaiso, 28th June, 1854.

IX.—*On Western Australia.* By AMOS SCOTT, of the Royal Sappers and Miners.

Communicated by Col. PORTLOCK.

Read, Feb. 13, 1854.

SIR,

Fremantle, Swan River.

YOUR former kindness and complaisance has induced me to offer a few brief observations to you on the geology and mineralogy of this portion of the vast island of Australia, trusting they may not be altogether uninteresting, however imperfect they may be. My duties not having permitted me to go far into the interior, I can only speak from actual observation of Fremantle and its vicinity. This town is situated at the mouth of the Swan River, on a promontory projecting into the sea; it appears to be of recent formation, as the surface is of the same character as three small islands at the entrance of the harbour, and which have not very long ago formed part of the mainland; there is no indication of minerals, the whole of the islands and mainland, where the houses are built, being sand mixed with shells. About half a mile distant there is a ridge of hills formed of sandstone and carbonate of lime, the former very soft and inferior for building purposes, the latter yielding a fair quality of lime, the fuel being a resinous wood, from the *Xanthorea* or grass-tree, growing in great abundance in the interior. The resin of this tree has peculiar properties, forming an excellent varnish, equal in every respect to that of shell-lac when properly prepared; the tops are eaten by the natives as a succulent vegetable. The face of the country beyond the hills presents nothing attractive to the agriculturist or mineralogist, if we except a small district near Perth and Guildford, which being situated on the margin of the Swan River, has the advantage of previous deposits of mud, &c. from the former course of the river, and which gives great fertility to that particular district; but this space being limited, it is laid out for gardens, &c. Beyond and about fifty miles in the interior there are hills composed of *red granite*, and some extensive beds of the *bisulphuret* of iron, similar to that found in the hills in the county of Wicklow, Ireland, and used for the manufacture of sulphuric acid; on analysis it proves to be a true bisulphuret. In the same neighbourhood also there are indications of copper, of no value as a commercial speculation. To the north as far as Champion Bay, but 50 or 60 miles in the interior, there are some valuable deposits of galena, cropping out even on the surface, yielding 70 or 80 per cent. of lead; copper ore has also been found here, yielding 60 per cent. The great distance, no roads, and the scarcity of water are great hindrances to a successful prosecution of mining enterprises;

but a company has been formed, and is now working the lead mines, and intend renewing their search for copper. In the neighbourhood of Guildford there is clay and sandstone of good quality, and our Company have procured some specimens of slate which promised well, but on digging deeper it was found in detached pieces of no value, embedded in clay: near this slate there is a stone similar in appearance and texture to the "Turkey stone;" it is a combination of silica, alumina, and iron. Anthracite coals have been obtained near Perth, but of very inferior quality. I do not think there is anything more of interest either to the geologist or mineralogist. The great scarcity of water, the parching heat of the dry season, and the uncertainty of the wet one, will always render this country liable to great fluctuations in the amount of agricultural products, and more or less dependent on other countries for food, and there is very great doubt in the opinion of some of the first settlers (now 23 years) that this colony can ever support even a moderate population. At present there is not six months' supply raised, and the large tracts of barren wastes between the few available patches give little encouragement to any agricultural undertaking. There are hundreds of miles where there is nothing but sand, bush, and forest. The trees of the latter are well adapted for both building and hydraulic purposes, the timber being impervious to the white ant, and retaining its properties under water; but the procuring of it is so expensive as to make any building much dearer than it would be in London.

The Convict Establishment and our Company have given an impetus to trade, but time will show whether it be judicious to select a spot for this purpose which offers so few inducements to agricultural pursuits.

To Captain Scott, R.E.

X.—*On the Navigation of the Murray.* By Captain THOMAS CADELL.

Read, Feb. 27, 1854.

To the PRESIDENT of the Royal Geographical Society.

Adelaide, Nov. 15, 1853.

SIR,—I do myself the honour to address you regarding the first steam voyage ever performed on the Murray River, from the sea mouth to within 50 miles of its junction with the Campaspy; also about 60 miles up one of its tributaries, the Wakul, and a few miles up the River Darling.

Having entered into a contract with the South Australian Government to place a steamer of a given horse-power on the

River Murray, and with the view of exploring the stream before taking the steamer up, in September, 1852, I made the first descent of the main branch of the river (Captain Sturt having descended the Murrumbidge) * in a small canvas boat, when I fully satisfied myself of its practicability of being navigated by steam power.

Since the time alluded to I have been principally employed in the construction of my vessels, in examining the sea mouth, and various portions of the Murrumbidge and Home, as well as other tributaries of the Murray. I here subjoin an extract taken from the Blue Book :—"The great surf that is constantly breaking on the Encounter Bay coast, at the spot where the River Murray discharges itself into the sea, renders the entrance into the river from the sea most dangerous, and indeed impracticable: hence, any steamer intended for the inland navigation must either be built, or put together, on the shores of the river or lake."

The sea mouth I do not consider in the same unfavourable light after many and repeated observations from the year 1848, when I first examined it, until the 15th of August last, when I took the steamer in. I have no hesitation in pronouncing it a navigable channel during quiet weather for properly constructed steamers, although great care would be constantly required, as its channel shifts every gale of wind, its invariable tendency being to work to the eastward.

Before the 'Lady Augusta's' arrival from Sydney, I established a party under an officer on Barker's Knoll (where Captain Barker of H.M.'s 39th was killed when taking angles), for the purpose of watching the breakers on the bar, and making "tidal observations," also to signalize to Port Elliot when the entrance might be attempted.

The result of these observations induces the belief that there is no *regular rise and fall*. For some successive days the tide of ebb would be found suddenly to cease from 10 to 11 A.M., no *slack water* would intervene, and the flood would come in, say for four hours. But for days, and I may say weeks together, the river steadily and without intermission disembogues itself into the sea.

The ocean all round Encounter Bay recedes every evening about sunset, advantage of which is taken by the settlers to cross the *Hindmarsh* and *Imman*, at their estuaries.

My boats have frequently crossed the bar at the sea mouth, and only one capsized took place: fortunately all of us were saved.

I may here mention a singular fact which came within my ob-

* Capt. Sturt not only descended the Murrumbidge, but also the Murray to the coast. See Journal R. G. S., vol. ii. p. 99, &c.; see also vol. viii. p. lvi.—Ed.

servation when watching the breakers at the sea mouth, and which shows that the instinct of the whale leads her to perform *exactly the same operation* which is found *so effective* with iron ships after a long voyage. It is this: that the whale, feeling herself covered and uncomfortable from *barnacles* on her skin, strikes in for the mouth of the river and there plays and gambols for hours, just outside or amongst the breakers. Having rolled the barnacles off in the fresh water, she again takes to sea. It is the knowledge that the fresh water kills the barnacles that brings her in: whenever it was practicable, my whalers, as well as those of the opposition fishery, were glad to take advantage of this peculiarity of the fish.

Lake Alexandrina is a large and generally shallow expanse of water, but fit at any season of the year to allow a vessel drawing 5 feet to pass, in still weather and in the proper channel. It will now not only be used in connection with the Murray River, but also to carry on its bosom the wool of the Tattiarra District, at present conveyed to Adelaide by crossing the *Hundred Mile Desert*, and a large portion of the wool now shipped at Guichen Bay will also be lake borne.

That part of the lake extending 90 miles in a S.E. direction from the sea mouth, called the Curong, is capable of being navigated at certain seasons by steamers of shallow draught.

Large tracts of agricultural country bordering on the lake will be speedily occupied and tilled.

The Murray at its entrance to the lake and in the neighbourhood of Wellington may be about 200 yards wide, with soundings frequently as deep as 10 fathoms.

From 100 to 150 yards may be taken as an average breadth of the river up to its junction with the Darling, which river seems to have very little influence either in contracting or expanding the main stream, it being fed principally by the back waters of the Murray.

Neither does the Murrumbidgee visibly increase the volume of waters of the Murray, although it is of great length; and its stream at Gundagai, in keeping with the general character of Australian rivers, although 300 miles farther in the interior, there presents a more open and freer channel than at its junction.

The Wakul, although only (as it is termed here) an "ana" branch, materially affects the basin of the Murray, and any stranger ascending would certainly steer up the Wakul, leaving the comparatively insignificant Murray on the right.

From the junction of the Wakul up to the neighbourhood of Swanhill, the Murray becomes contracted, tortuous, and much impeded with fallen timber, "*snags*" and "*sawyers*" presenting many serious impediments to navigation, and the set of the current

is so strong, that the rudder becomes comparatively powerless, and the vessels constantly take the ground, or rather the banks, which latter are very steep.

In the neighbourhood of Swanhill, where the Murray's course lies through reed-beds, no obstacles interrupt the navigation, although the river is still very tortuous.

Above Swanhill it is divided, by an island of considerable extent, into two branches, the smallest and most easterly being called the *Mabut*, which is unnavigable. On the junction of the two branches the river again expands, and at Aldbury presents a good navigable stream.

The above remarks are only to be considered applicable during the floods, which are most capricious and sometimes sudden in their rise, although the "*flood-wave*" travels down the river at a very slow rate. For instance, on my passage up in the '*Lady Augusta*,' I met the *flood-wave* below the Darling, passed it before I reached Swanhill, but did not reach the second *flood-wave*, which, only a few miles distant from me, was caused by the *Campaspy's* rising.

On my downward voyage I found that the *flood-wave* had preceded me (and the river fallen) until I came up with it below *Chowilla*, and I did not run past it until near *Wall*, about 60 miles from Wellington.

I hope, when I become better acquainted with the velocity of these "*flood-waves*," to be able to give your learned Society some interesting information, and the establishment of Nilometers at given points on the river would bring out some curious facts.

The last and "*snow-flood*" generally comes down this month, caused by the melting of the "*snows*" on the Australian Alps.

The vertical annual rise of the Murray may be estimated from 16 to 20 ft., but the Murrumbidgee often doubles and frequently trebles that "*rise*." When I visited Gundagai in November, 1852, about four months after that township was swept away, I saw *horses* and *bullocks* suspended by the legs by limbs of the gum trees, full 30 ft. above the bank of the river and 40 above the stream.

The Darling is the most uncertain of all the tributaries of the Murray, and its rise is at times very sudden: this year it has only been navigable for about 30 miles.

If the Murray River is found navigable as high as the Darling for six months, and as far as Swanhill for eight months, it is as much as I expect.

The Colonial Governments will probably unite in the expenditure of a certain sum for clearing the river of fallen trees, "*snags*," &c. &c., the accumulation of ages, which will very much facilitate and increase the safety of navigation; many overhanging branches

of trees will also require to be cut off, as they constantly endanger the funnels of the steamers.

The banks of the river are plentifully covered with fine timber; indeed for hundreds of miles on a stretch the river appears like an "avenue," with rows of trees on both sides; and what is remarkable, the same "genus" of trees never appear facing each other. If gum trees are on one bank, the opposite grows "*she-oak*," "*peppermint*," and "*box*." These trees, seldom interspersed with the gum, suddenly and without any apparent cause shift over to opposite sides of the river. Thus, my shipbuilding-yard on the Wakul is surrounded on one side by crooked box trees, from which the frames or ribs are taken, whilst we are forced to cross to the opposite bank to cut planking from the straight "flooded gum" trees.

Pines crown all the eminences on both banks of the river, as far as I have ascended. Unfortunately this pine is found so brittle, knotty, and liable to decay, that we only use it for "fuel;" the bark contains much "resin," but although quick and fierce in burning it does not last long, and we find good *dry gum* to be our best burning wood.

Amongst the pine clumps is frequently found a stunted *bastard sandalwood*, unfit for commercial purposes, and used by us for boats' timbers and knees.

Magal abounds betwixt the Darling and Murrumbidgee, in the back country, but it never attains any size greater than a bush.

The high "ridges" or "cliffs" which the Murray cuts through, sometimes obliquely, sometimes at right angles, terminate on the N.S.W. bank about 8 miles below the junction of the Murrumbidgee, and on the Victoria side at Willilá, near Euston. They are composed principally of a *red* and *white* clay, with layers of half calcined white sandstone, friable to the touch and rapidly dissolving in water.

The formation of the cliffs in the neighbourhood of Morrumbidgee, Captain Sturt has described in his first work.

From the point alluded to on the N.S.W. side, the Murray, as high as the Ovens River, flows through a vast level country, with occasional slight undulations dignified by, but undeserving, the name of hills.

Winds.—Like other large rivers, the Murray appears to draw a current of air up its stream. It seems that the prevalent wind in the country through which it flows is S.W., although, before the "great flood" of 1852 swept away the old camps or *gunyas* of the natives, I observed that they generally fronted or faced to the N.W., which would tend to show that the prevailing wind was from S.E.

At sunset, should the wind have been up, it generally dies away, and is succeeded by a faint air from the Northward or down stream.

By the same mail which takes this hurried communication (as I leave to-morrow on my second voyage) I send newspapers and a pamphlet containing articles on the river, which I trust may be found of interest.

Since my return, the Legislative Council of this colony have awarded to me a "*gold medal*" for opening up and showing the capabilities of the river, and have also voted me 4000*l.* as a bonus, to place two steamers on the upper rivers. Next flood I look forward to having five steamers on the river, and a boat to go outside. These steamers, with a sufficient number of barges, will be amply sufficient for all goods and passenger traffic. Indeed, the Governments of all the colonies, as well as the settlers on the river, have given me every inducement to prosecute the enterprise.

When the new steamers are on the river I look forward to reaching the *Mitta Mitta* by the *Home*; *Seymour*, about 40 miles from Melbourne, by the *Goldburn*, between *Yass* and *Gundagai* on the *Murrumbidgee*, and *Wangaratta* on the *Ovens*: as to the *Darling*, I am afraid to hazard an opinion.

I did myself the honour of addressing you by letter, dated "*Lady Augusta, 5th Oct., 1853,*" proffering my services to leave any stores on the Murray or Darling, which might possibly be required for the "*Exploring Expedition*" which, under your auspices, is to be started for the interior. I can now only repeat what I said then.

My time, since my return to Adelaide from the Murray, has necessarily been much occupied in carrying out affairs connected with a navigation of such recognised importance, which I trust will serve as an excuse for the hurried manner in which these remarks have been thrown together; and, looking forward some day to be of substantial use to your learned body,

I have the honour to be, Sir,

Your obedient servant,

THOMAS CADELL.

XI.—*Notes on the Passage of Hannibal across the Alps; and on the Valley of Beaufort, in Upper Savoy.* By Professor PAUL CHAIX, of Geneva, Corresp. F.R.G.S.

Read, May 24, 1855.

THAT "*vexata quæstio,*" the passage of Hannibal, has recently undergone fresh investigation in a work by Mr. Schaub, of Geneva. The author begins with a brief summary of opinions of certain previous writers. Many of the views that have been advocated

appear to have been suggested by a desire to identify the line of march with the neighbourhood in which the inquirers resided, or by similar circumstances of an accidental nature. Mr. Schaub regards the theory of Whittaker, followed by Simler and Grosley, which leads Hannibal over the Great St. Bernard, as the most paradoxical.

Deluc and Melville produced the most remarkable work on the subject, in three editions, the first of which appeared in 1818. It was ably supported by Wickham and Cramer in 1820, who increased its importance by a few additions and modifications. These authors adopt Roquemaure as the point where Hannibal crossed the Rhone, and Vienne as the northern extremity of his march up the left bank of the river. The triangular interval between the Rhone and the Isère in Dauphiny, compared by Polybius to the Egyptian Delta, answers to the *Insula Allobrogum*. The Carthaginian General entered Savoy at St. Genix d'Aosta, and crossed the hilly country at Mont du Chat (*Mons Thuates*), where his first encounter took place with the mountaineers, who kept watch during the day only. From thence Hannibal advanced through the fine plain of Chambéry, and along the wide and fertile valley watered by the Isère, to Bourg St. Maurice, crossing the Alps at the pass of the Lesser St. Bernard, where he fought his last battle with the mountaineers, and then halted on its level plateau for two days, waiting for stragglers.

M. Deluc attached too much importance perhaps to the discovery of a great white rock and of large bones upon the Lesser St. Bernard, and of a silver shield which was found by a farmer in 1714, and deposited in one of the Parisian museums. The shield was dug out of the ground on the estate *Du Passage*, between *La Tour-du-Pin* and *Abrets*, half a mile from the road between Vienne and Chambéry. It was ornamented with Punic intaglios and bas-reliefs, and considered to have been a votive offering. The best arguments of Deluc, Melville, Wickham, and Cramer were based on the concordance of their itinerary with the distances, the number of days, and the geographical data mentioned by Polybius; also on the adoption of that text, almost exclusively, as the only faithful guide; and further, on the coincidence of that itinerary with a choice of locality and season such as would be made by a man of common sense, and particularly by a general commanding an army. A different opinion was maintained by the Marquis of Saint Simon, who attempted to prove that the Carthaginians marched along the river Ubaye to Mount Viso. This route leaves nine days to be accounted for. The author supposes that the army was misled by the guides, and that the time was spent in ascending the mountain. This theory affords the author

an opportunity of finding a pulpit, at a height of 13,000 feet above the sea, for the celebrated speech reported by Livy! Apparently for the sake of that result, he does not hesitate to trace the route of an army over a lofty mountain, instead of through passes 6000 or 7000 feet lower. But these guides had been chosen to meet Hannibal by the Insubres, a nation in frequent intercourse with Transalpine Gaul, their original country. The Insubres had found their way to Carthago Nova, in Spain, and the guides they had selected were not likely to mistake the safest road to Italy. Hannibal was in alliance with the Allobroges, as well as with the Insubres, and a prince of the Cisalpine Gauls was with the guides. That road was undoubtedly the safest for him which joined the territories of those nations.

In 1851 M. Replat, a barrister of Annecy, published a work entitled 'A Note on Hannibal's Passage,' supporting a theory originated by M. Blanc of Beaufort, and Count Vignet. M. Replat leads Hannibal from the Rhone on reaching the Isère, not only below Vienne, but without entering the territory of the Allobroges, in opposition to the positive evidence of Polybius and Livy. He places the *Insula Allobrogum* between the Isère and the Drôme, although the high and very bold mountains of Royans, Trièves, and Vercors give that tract no resemblance to the Egyptian Delta. The "*Insula*" lies so evidently north of the Isère, that another commentator, M. Latronne, makes the Carthaginians turn back and recross the Isère in favour of his theory, which continues the line of march along the rivers Drac and Durance to the Pass of Mont Genève.

M. Replat, however, follows the *left* bank of the Isère to Pontcharra, near Fort Barraux, where he places the site of the first battle with the mountaineers, who left the passage defenceless at night. He then crosses to the opposite bank, and reaches Albertville and Conflans. From the last-named place MM. Vignet, Blanc, and Replat advocate the claims of a new route, never before suggested. Turning from the great valley of the Isère because it appears to be "too crooked," they endeavour to trace the African General's march along the hitherto unheeded valley of Beaufort and through a labyrinth of defiles to the pass of La Seigne and the Allée Blanche, at the southern base of Mont Blanc. This route is chosen by M. Replat as the shortest way across the great ridge of the Alps by an Eastern pass.

Valley of Beaufort.—The Valley of Beaufort lies N.E. of Albertville, between that town and Châmoûnix. There are four routes between it and the Chapieu, which forms the approach to the western foot of the Col de la Seigne:—1st. The Pass of La Sauce, which is so forbidding that it would be madness to think of

it. 2nd. The Pass of Cormet, or Platte, or Croix de Biollay, which presents an accessible tract of pasture-ground, after an elevation has been attained of 6441 feet, almost the height of the Lesser St. Bernard. 3rd. The Col du Mont Joly, which I found to be higher. 4th. The Col de la Fenêtre, still higher. The 3rd and 4th do not lead directly to the Col de la Seigne, but into the Vale of Montjoie, and then over another pass, the Col du Bonhomme; to the Chapieu, where all these routes converge, leaving the Pass of la Seigne still in advance.

M. Replat prefers the 2nd route through the Pass of Cormet, or Platte; but he thinks it not altogether improbable that Hannibal, "misled by his guides," ascended in succession the Col du Mont Joly, the Bonhomme, and lastly the Col de la Seigne; three difficult passes, in preference to the single and easy Pass of the Lesser St. Bernard.

M. Replat's 'Note' has been answered in the work by Mr. Schaub, mentioned at the beginning of this paper. Mr. Schaub is intimately acquainted by foot journeys with all the passes in the Alps. His thorough knowledge of Greek has made him familiar with the chief authority in the original. He follows the names, distances, and times given by Polybius; he does not dispute the competency of the guides, and he concludes that the Carthaginian General, in choosing his road, kept in view the sustenance and safety of his army, as well as the rapidity of his march.

At Pontcharra, the position selected by M. Replat for the first encounter with the mountaineers, Mr. Schaub shows that there is not in the whole neighbourhood any mountain pass answering to the historian's description; and the distances from the Isère to Pontcharra are also quite inconsistent with Polybius.

The Valley of Beanfort is easy of access at its entrance only; but it soon merges into narrow defiles, with stupendous ridges and precipices, leading to a chaos of mountain passes, at a great elevation. On the other hand, the Valley of the Isère is wide and open throughout, from Albertville to the foot of the Lesser St. Bernard. It is almost level, fertile, and now occupied by numerous wealthy villages and towns. M. Replat's supposition that it was marshy and overflowed is quite groundless.

The Lesser St. Bernard is one of the easiest passes in the Alps, and lies at the southern base of the Cramont, a mountain identified with the Cremonis Jugum, mentioned by Cælius Antipater as the locality of Hannibal's passage. There is also a table-land on the top of the pass, 6 miles long, and 900 feet lower than the Col de la Seigne, sufficient, it is presumed, for the encampment of Hannibal's army while waiting two days for stragglers. Three days more were spent in the valley below, owing to the passage being

obstructed by snow. The Col de la Seigne, on the other hand, passes the northern base of the Cramont. There is only a narrow ridge on its summit, and there is no flat spot lower down, as M. Replat gratuitously imagines. It is also 900 feet higher than the level plateau of the Lesser St. Bernard. The distance from Albertville to the Italian valley of Aosta, along the Isère and over the Lesser St. Bernard, is 56 miles, measured along the road, which is flat for 34 miles, and the pass is easily crossed in the remaining 16 miles.

Following M. Replat's itinerary through the Valley of Beaufort, the distance between the same points is 42 miles, scarcely 8 of which may be termed easy, while the remainder includes two and even three very high mountain passes, in a very rugged, uncultivated, and inhospitable country. It is also well known that these passes are impracticable at the end of October, when Hannibal's passage occurred; and as each pass would be a day's march for an army, the saving of 8 miles on level ground appears to be an insufficient reason for encountering such obstacles.*

As the Valley of Beaufort is very little known, a sketch of its present state may be useful to tourists, and perhaps afford some additional material for Mr. Murray's excellent Guides.

The situation of the valley has been already described in a previous page of this paper. It includes within its branches, and the surrounding ridges and passes, an area of 165 square miles within a circumference of 48 miles. The chief town, St. Maxime de Beaufort, is 12 miles N.E. by E. of Albertville, and it is situated at the junction of five valleys, which form together the Beaufort country. The Vale of Hauteluce is on the N.E.; the Vale of La Gîte is on the E.; Pontcellamot, or Poncelamont, is on the S.; Trecols and Roselein are on the S.E.; and the Valley of Beaufort, in which these unite, is on the W.

Each valley feeds a stream. The Doron flows from La Gîte, and receives the Argentine from Pontcellamot; the Dorinet, or lesser Doron, from Hauteluce; and the Trecol and the Roselein from the valleys of the same names. The Doron then pursues its course for 10 miles below Beaufort, till it unites with the Arly, a tributary of the Isère, at Conflans.

An indifferent road ascends from Albertville, along the banks of the Doron, to St. Maxime de Beaufort. In other directions

* The Dissertation by Count de Fortia d'Urban contains a list of many works on Hannibal's Passage. In 1854, "a Treatise," by Robert Ellis, M.D., was printed at the University Press, Cambridge, and answered in "a Criticism," by W. J. Law, A.M., London, 1855. Mr. Law notices the announcement of M. Chaix's Paper in a postscript, the remarks in which appear to be based on an erroneous assumption of M. Chaix's views.—[See also a work on the same by H. L. Long, 1831.—Ed.]

the country is only accessible through a dozen cols or mountain paths, practicable only for mules and pedestrians. These passes are, on an average, about 6500 feet above the sea, and the following are the most remarkable:—On the S.W., La Bâtia, leading from Arèche to La Bâtia, in the valley of the Isère. On the S., the Louse (? Luce) and Grand Cornet, crossing from the head of the Vale of Pontcellamot to the Isère in Tarentaise. On the N.W., the Col de la Leizette passes between Hauteluce and Flumet, through Notre Dame de Bellecombe. On the N.E., the pass of La Fenêtre and the Col Joly lead to Chamounix, through the Vale of Montjoie. On the E., the pass of La Platte, or Croix de Biollay, leads from La Gîte, and that of La Sauce from Roselein to the valley of the Chapieu in Tarentaise. A few other passes form internal communications from one valley to another, such as the Char de Montagne, or Col de Boulin, between Arèche and Trecols, and the Plan de l'Estace, between La Gîte and the upper part of Hauteluce. La Sauce is perhaps the most difficult, especially at the narrow part called Gorge des Cavés, but none of these paths is dangerous at a proper season.

The time required to reach Montiers on the Isère from St. Maxime de Beaufort, either through the Grand Cornet or the Col de la Luce, is equal to a day's march. It is 4 hours from Beaufort to the Chapieu over the Col de la Platte; and half a day from the upper part of Hauteluce to La Gîte through the Plan de l'Estace. A difficult march of $1\frac{1}{2}$ hour is required to reach the crest of Mont Joly from the Col Joly, and the descent to Notre Dame de la Gorge occupies the same time; from thence it is $2\frac{1}{2}$ hours to Contamines. The distance from Flumet to the Col de la Leizette is equal to $4\frac{1}{2}$ hours, and the road lies through cultivated land and swampy pastures. Thence to Hauteluce is 1 hour more.

None of the mountains in the Beaufort country is of a great height; but their majestic summits are capped with snow before the autumn begins, especially the Needle of the Grand Fond and the Crest du Rey (King's Summit). Mont Joly, the Point of Arotte, and Rousselette, to the E., rise in front of Mont Blanc.

The Rocks of Enclaves are perhaps the most curious feature in the orography of this district. They form a group of mountains in its centre, between the Doron and the Dorinet. An oval, solitary basin is hollowed out in their midst, and surrounded on all sides by granitic ridges so completely that its waters can only be discharged through subterranean channels, and over numerous and magnificent falls, into the wild valley of La Gîte. A cluster of chalets, named Outray, occupies the centre of this secluded basin. I found there plenty of rock-crystals and samples of copper and iron ore, besides anthracite coal and talcose schists.

The following is a List of Measured Altitudes, with the Names of the Observers.

Positions.	French Mètres.	English Feet.	Observers.
Albertville	315·7	1033·8	A. Beaumont.
"	338·0	1099·3	Billiet.
Aixme	758·0	2463·5	Beaumont.
"	711·0	2310·7	Billiet and Gravier.
Lesser St. Bernard, Pass	2206·0	7169·5	Escher.
" Hospital	2151·0	6990·7	Billiet.
"	2172·0	7059·0	Billiet and Gravier.
Chapieu	1549·0	5034·2	Studer.
"	1546·0	5024·5	Favre.
St. Maxime de Beaufort	799·1	2617·0	Beaumont.
"	797·0	2590·2	Beaumont.
"	754·0	2450·5	Favre.
" at the Inn, 3 observations	744·1	2436·9	Chaix.
St. Maxime de Beaufort at the Church, on a hill	749·8	2435·5	Chaix.
Pass of La Platte, or Croix de Biollay	1967·0	6392·7	Studer.
"	1975·0	6418·9	Favre.
Pass of La Luce	2138·0	6946·0	Favre.
Grand Mont, north of La Luce	2720·0	8940·0	Favre.
Pass of the Grand Cormet	2139·6	7007·0	Favre.
Pontcellamont, chapel of St. Guérin	1523·3	4950·7	Favre.
"	1529·0	4963·2	Favre.
Char de Montagne, or Col de Boudin	1730·0	5622·5	Favre.
Roselein, or Roselen	1481·0	4813·2	Favre.
"	1464·0	4758·0	Favre.
Prax, village S. of Beaufort	999·8	2694·3	Chaix.
Arèche, church	1027·7	3323·3	Chaix.
Fontaine, hamlet E. of Beaufort	1033·4	3358·5	Chaix.
La Gîte, at Cyril Freyzen's Cot	1658·6	5390·4	Chaix.
Pass of Plan de l'Estace, above La Gîte	2286·9	7432·4	Chaix.
Lake of La Girotra	1712·9	5566·9	Chaix.
Pass of Mont Joly	1975·5	6420·3	Chaix.
"	2028·0	6590·0	Favre.
" at Chalet Avocat	1652·4	4470·9	Chaix.
Annuit, in vale of Hauteluce	1233·7	4009·3	Chaix.
Hauteluce	1141·7	3710·5	Chaix.
" (better observations)	1158·7	3765·7	Chaix.
La Leizette, pass above Hauteluce	1775·7	5770·0	Chaix.
" (inferior observations)	1782·8	5794·1	Chaix.
Bellecombe, Notre Dame de	1118·1	3633·9	Chaix.
"	1115·5	3624·7	Chaix.
Flumet, on a slope	897·0	2915·2	Chaix.
" in another part	922·5	2998·1	Chaix.
Col de la Seigne	2519·0	8186·5	Chaix.
Oratoire du Glacier	1774·0	5765·5	Chaix.
Col des Tours	2661·0	8648·3	Chaix.
"	2682·0	8716·5	Favre.

The geological structure of the Beaufort country offers the following indications:—Mica-slate forms the slope of the moun-

tains from Flumet up to La Leizette; but the crest of the pass is clay slate, dipping to the S.E., and it is also seen along all the crests as far E. as the Col Joly. It is found again at the Cormet, dipping N.; but on the southern slope of that pass it dips S. Clay-slate rises in immense masses between Arèche, Petit Cœur, and Cévins, where abundant quarries are worked, yielding very large fine-grained and shining slabs. Mines of anthracite coal are worked near Petit Cœur, and others have been recently opened at Arèche in the Vale of Pontcellamot. Mountains of granitic slate form the eastern slope of Pontcellamot, and occur again in the vale of Trécols and on the southern slope of the Cormet. The Doron flows for miles in the vale of La Gîte, through a narrow and deep cleft in talcose schist, dipping to the S. and E.

Each of the smaller valleys has peculiar features. The vale of La Gîte is without doubt the finest. At its head a waterfall, issuing from the wild gorge called *Les Cavés*, in the pass of La Sauce, unites with another stream in a flat meadow to form the torrent of Doron. From thence the Doron plunges into a deep ravine, extending westward between vertical walls of rock, and becomes an uninterrupted cascade for many miles, increased by numerous streams which descend in foaming sheets from the rocks of Enclaves on its right bank, while the left bank is shaded by tall and dark pines. Scenery equally wild and magnificent forms the entrance from this valley into Roselein.

The vale of Pontcellamot in its lower part is more open, and the forests which crown its sides surround a basin of cultivated land and slopes of smiling pastures. The number of hamlets bespeak a larger and more wealthy population scattered around the larger village of Arèche. A pretty fall is formed by the river Argentine at Arèche. A winding path ascends to the second terrace of this valley, where the forests encroach farther down upon the cultivated land, and the river is broken by numerous falls, adorned with tall spruces, rearing their heads on the verges of precipices. On the third and uppermost terrace are extensive pastures, interspersed with *châlets*, but without any permanent dwellings. The solitary chapel of St. Guérin is raised on a knoll in the midst of the surrounding circus, and the paths over the Col of La Luce and the Cormet diverge from it across meadows and crumbling slate soaked with water. From the pass of the Grand Cormet there is a most splendid view of the snowy mountains of the Maurienne and Tarentaise, with extensive glaciers, and the fertile and broad valley watered by the Isère, and dotted with fine villages. The path descends to Aixme, where several Latin inscriptions have been discovered which suggest its identity with *Forum Claudii* or *Axima*.

The vale of Hauteluce is the broadest and least wild in the

Beaufort country. It is fertile, and productive of wheat and hemp, while the forests merely crown the summits of the cultivated slopes. The cows are small but pretty, and the sheep yield a good fleece.

E. of Hauteluce, the right slope of the valley is named *Montagne de la Ruelle*, and the left slope *Combe du Revers*. The small river *Dorinet* is formed in the *Combe à Dran*, a barren gorge at the feet of the *Aiguille Roussette*, the *Fenêtre*, and the *Plan de l'Estace*. It forms a waterfall where it leaves the *Combe* to enter the valley of *Hauteluce*, and it receives at the same place, through a more beautiful fall, the waters from the lake of *La Girotta*. I surveyed the lake. It is very picturesque, nearly surrounded by sloping pastures, with a few chalets, partly inclosed by dark, rocky cliffs, which give its clear waters dark-green, violet, and even black hues, according to the nature and depth of the bottom. I found the lake to be 1713 mètres above sea; the temperature of the waters 56° Fabr., that of the air being 50°, on the 15th Sept. 1853, at half-past 10 A.M.

The only vestige of feudal times in these valleys is the ruins of a few towers on a hill N.W. of *St. Maxime*. According to the oldest memorials, the *Beaufort* country was a dependency of the archbishops of the *Tarentaise*. The feudal homage was due to them, when the princes of the *House of Geneva* acquired several tenures there; and a deed dated July 31, 1220, recites that the *Count of Geneva* bound himself to render the yearly tribute of two large trout. There were, however, at the same time *Lords of Beaufort*, who, on the calends of April, 1271, sold most of their rights to *Beatrice*, the last *Baroness of Faucigny*. She erected the country into a *Barony*, which she united to her own, and both have since partaken of the same fortunes. In 1355 they were ceded to the *Count of Savoy*, *Amadeus VI.*, by *Charles*, then *Dauphin*, and afterwards *King Charles V. of France*. When *Henry IV.* invaded *Savoy*, he came to *St. Maxime de Beaufort* with a body of troops on the 10th of October, and quartered in the castle. On the 11th he marched up to the pass of *Cornet*, to prevent *Duke Charles Emmanuel of Savoy* from entering the country from *Piedmont* over the *Lesser St. Bernard*; but he returned on seeing that all the passes were impracticable, being already blocked up with snow, and he left *Beaufort* on the 12th.

Agriculture affords but a limited resource to the inhabitants of these valleys. Saw-mills are numerous, especially at *St. Maxime*. The breeding of cattle and fine mules is the chief occupation. Cheese is also made on a large scale, and either sold to *Piedmontese* or bartered for rice and salt.

The inhabitants are healthy, active, hard-working, and abstemious. Their features bespeak intelligence. The women are not





destitute of beauty, and they are remarkable for an elegant head-dress.

The preservation of their roads demands their constant exertion, owing to frequent floods; but they are never in a satisfactory state.

There is a tolerable inn kept by Henry Martin at St. Maxime; those at Arêche and Hauteluce are very indifferent. The cot of Cyril Freydon, at La Gîte, can shelter the traveller bent on crossing the passes of La Perrière, La Sauce, and the Plan de l'Estace; but Lavocat's chalet should be avoided.

XII.—On the Volcanic Mountains of Hawaii, Sandwich Islands.

By J. G. SAWKINS, Esq.

Communicated by Sir ROB. L. MURCHISON.

Read, June 25, 1855.

THERE are four volcanic mountains in the island of Hawaii, viz., Kohala, Muna Kea, Hualalai, and Muna Loa. The decomposed state of the rock being greater on Kohala than on any other, and the total absence of black lava, lead me to believe that it is the oldest of the four. I also think that Muna Kea is next in age, and that Hualalai and Muna Loa are the most recent and of the same period.

The height of these mountains above the sea is estimated as follows:—

Kohala	about	9,800 feet.
Muna Kea	13,842	„
Hualalai	11,020	„
Muna Loa	13,651	„

I landed on the western side of the island at a place called Kawaihai, and crossed over to the eastern coast. This gave me an excellent opportunity of seeing the decomposing effects of the moist atmosphere on the old lavas of the more northern and older volcanoes, which are no doubt co-existent with the formation of the island.

The most remarkable features on the N.E. portion of the island are the immense cliffs of compact lava, separated by ravines, varying in depth from 200 to 2000 feet, over the sides of which a series of cascades fall between Niulii and Hilo (or Byron's Bay). To the S. of that bay the lava assumes quite a different appearance; the colour is black, and its structure like the slag of a furnace, having no definite form, though its cleavage is vertical.

This black or recent lava extends itself into the ocean, forming a shelf, as though it had spread out horizontally from the coast.

Occasionally holes of various dimensions appear, through which the sea is frequently seen to force itself.

There are many landslips on the south-western part of the island, like that at Hukena, but they have fallen so steep that anchorage is only obtained within a few yards of the shore; others are on the N.E., where the shore is so abrupt and precipitous that a landing cannot be effected except in a calm.

One side of this island presents an extraordinary difference from the other, and affords instructive evidence of the cause of the decomposition of the lava. The W. and S.W. sides are arid, barren, and desolate; while the N.E. and E. are moist and covered with the most luxuriant vegetation, with numerous water-courses.

It is on the latter sides where decomposition takes place. The moisture arises from the condensation of the clouds brought by the trade winds, which accumulate at an elevation of 8,000 to 11,000 feet above the sea, beyond which height their density seems to prevent their rising, until a portion of their watery contents is discharged.

Proceeding from Hilo to the crater of Kiluea, through Ooloo, are, at two miles to the west, two small craters, a few hundred feet above the sea. The lavas of these have been decomposed into fine red soil, the general characteristic of the Kohala deposits, which are covered with dense forests. But five miles farther on the whole aspect of the country changes, and bears evidence of the devastating effect of a more recent overflow from some of the upper craters, which encircle Muna Loa. Instead of the stately and dense forest which doubtless once existed here, there exist now only grass and ferns, which derive their nourishment from accumulated decomposed particles of lava, that fill the interstices of the yet undecomposed rock. These streams of lava on the mountain slope intersect the forests, and are so conspicuous that their courses can easily be traced to their origin, and give proof of their age, as compared with the modern lavas, until we rise to an elevation where vegetation disappears from other causes.

Ascending 32 miles on, with the gentle rise of 124 feet to the mile, we reach the crater of Kiluea (3970 feet), the mighty work of recent natural operations. The basalt or solidified lava forming the rim of the crater is more than three miles in diameter. Then there is a descent of about 70 feet to a plain covered with grey ashes; again a descent with occasional fissures on the slope to a lower level, then a still further descent on earth of a light brown and yellow colour, and at last we arrive at a lake-like mass of hard blackish lava (992 feet), which, a short time previously, was in a state of fusion. On its surface there are many inequalities arising from shrinkage. It also exhibits diminutive volcanoes, from which bits of molten lava are thrown up, which cool on drop-

ping, and form miniature mountains, the lava running down their sides, like tar on the side of a barrel. Here and there are deposits of crystallized sulphur, peroxide of iron, &c., with dense, hot vapour constantly arising from beneath. Occasionally the lava falls in, leaving large circular holes, from 20 to 80 feet deep, showing plainly that the crust in such places is only about 30 inches thick. A vertical cleavage is apparent, but it is not regularly prismatic or cubic.

The lava of the basin presents the appearance of black satin, and is so fragile as to crumble under the feet, and being dangerous, the guide, who generally possesses less courage or more prudence than others, dissuades the visitor from looking into the molten lake to see it boiling, cracking, and flowing from the N.E. to the S.W., opening its blood-red seams, and rolling from one side to the other, carrying the cooled grey surface beneath its liquid redness, like copper in an immense crucible. The earth quaked beneath us, and gusts of sulphurous vapour rose above our heads. The size of this lake of molten lava, concealed as it was by vapour, we could not estimate. The distance of the liquid lava from the edge on which we stood appeared to be about 100 feet beneath us, and it ebbed or flowed every instant towards the surface, and might at any moment rise beyond its present limit, even to the height it did in 1847, when it poured its currents down the mountain slope, and penetrated some old fissure or channel of a previous overflow, and another island, at some distance from the shore, was thrown up.

In 1851 there was an elevation of 150 feet in the centre of this crater, which extended over the greater part of it. There were also several small cones spiring forth bits of lava and hot vapour. On ascending the largest of these, the walls were found to be only 28 inches thick, forming a dome, and covered to the base with silicious ashes, sulphur, salts of iron, &c. It was curious to see the lighter silicious lava drawn out by the force of the wind into fine hair-like fibres (*Pele's hair*). The specific gravity of this substance was much lighter than the black lava, and resembling frothy obsidian: it floats on water. Some of the lava has colours on its surface, like peacock copper or sulphurous coal; some is granulated; some has long white lines through the black, which is the general colour of the new lava.

On examining the crater of Mokuoweeweo on the summit of Muna Loa, I found the country level for six miles. It then becomes very rugged, the whole surface presenting the same appearance as a field of broken ice, and the rock assumes every imaginable form, even to the coiled rope on a ship's deck. Occasionally there are upheavals apparently from explosion, throwing the crust of lava upwards in fractured cones, sometimes leaving an orifice in

their midst. There is also evidence of under-currents of lava which have left hollows or tunnels on their course down the mountain. The falling in of the surface leaves open caverns, which are sometimes filled with snow, originally drifted by the trade wind into these hollows, and solidified into ice, at about 11,000 feet above the sea.

The ascent becomes more arduous as we proceed; climbing becomes difficult and dangerous; indeed such was the roughness of the surface that some time was consumed in finding a space whereon to rest.

Large beds of frothy obsidian are near the summit. At the uppermost crater on the edge of its vast area, 784 feet deep, without the sound of animated being, the eye rests on complete desolation; and one is led to reflect that such may have been the state of our earth at its creation.

From the summit of Muna Loa the low land is invisible. Man stands there seemingly apart from the beneficent and luxuriant provision God was pleased to prepare for him. No Paradise is there—all is desolation; but in descending we see how the influence of the atmosphere dissolves the substances contained in the lava, and forms a fertile soil.

To the S.E. the crater of Pohakuhanalie is connected with that of Mokuoweoweo, which is much deeper; its walls being nearly perpendicular, and exhibiting 92 layers or beds, unintercepted by dykes. S. of the last-named crater there is another, the lava of which was so hot at the time of my visit that we could not walk over it. We came therefore to the conclusion that this was the seat of eruption that had been noticed a few days before.

XIII.—*Account of the Proceedings of H. M. S. Enterprise from Behring Strait to Cambridge Bay.* By Capt. R. COLLINGS, R.N., F.R.G.S.

Communicated by Sir GEORGE BACK, R.N., F.R.G.S.

Read, June 25, 1855.

THE priority of discovery of the Prince of Wales Strait by Capt. M'Clure in 1850 and the researches of Dr. Rae upon Victoria Island have deprived the voyage of the *Enterprise* of much of its interest. Yet the fact of having penetrated farthest to the eastward and approached nearest to the spot reached by the *Hecla* in 1819, together with our extrication from the ice, and consequent opening of the sea between Point Barrow and the Mackenzie as a whale fishery, in conjunction with such geographical remarks as must transpire in the navigation of unknown seas,

will, it may be hoped, afford sufficient matter to the Society for a short paper.

Sailing from Plymouth on the 20th of January, 1850, we reached the Straits of Magelhaens on the 10th of April, and leaving the Gorgon to bring on our consort the Investigator, we proceeded through the first and second narrows, touched at the Chilian settlement of Punta Arenas, and reached Fortescue Bay on the 17th, the Gorgon and the Investigator arriving the same afternoon.

Thence the steam-vessel towed both ships into the Pacific Ocean, where we at once encountered so mountainous a sea that the tow ropes broke, and it became necessary to cast off one vessel. The Gorgon carried the Enterprise two hours to seaward, and then returned for the Investigator: thus the two vessels parted company, which were never again destined to meet.

After a long passage of sixty-six days we reached the Sandwich Islands, where I remained six days in the hope that our consort would arrive; then, deeming the delay certain to be occasioned by our communicating with the Herald and Plover would give her an opportunity of rejoining us, I put to sea, following the course pursued on former occasions by Capts. Beechey and Kellett, and running down my longitude in the Tropics, but advising Capt. McClure, if he was late, to take the *Amoukta Channel*. This course he pursued most fortunately, and while we were delayed by light winds and calms, he, favoured with a fine breeze, reached the edge of the ice eighteen days before us, and found a wintering place in the Prince of Wales Strait that season. We rounded Point Barrow on the 21st of August in a sea comparatively free from ice, but were stopped on the following morning by the pack, which was impervious. As it became necessary to retrace our steps in order to reach the land-water, and looking to the advanced state of the season, I consulted with the officers; and they concurring in the opinion that it was not practicable to proceed to the eastward this season, I determined to devote what remained of it in an attempt to reach the Polynia. We accordingly returned upon our track, and in the same longitude where Capt. Kellett the previous year had seen a promising opening, were enabled to get to the northward, eventually reaching lat. $73^{\circ} 23' N.$, where our progress was completely arrested; and at the end of August, finding there was no hope of the ice breaking away this season, I returned to the south. As a proof of the appropriate term of Pacific to the ocean which bears that name, I may mention that we sailed from lat. $32^{\circ} S.$ to $73^{\circ} N.$, going over a distance of 11,300 miles in 116 days, without ever once having occasion to reef the topsails!

Being aware of the capability of Hong-Kong to make good the

provisions and stores which we had expended, and that by resorting thither we should not have occasion for any assistance, and be enabled to revictual without the expense of hiring transports, I selected this spot to pass the winter; and reports being still rife among the Esquimaux relative to white men having been seen upon the shores of the Polar Sea, I availed myself of the offer of Lieut. Barnard and Mr. Adams, assistant-surgeon, to remain at Michaelowski Redoubt, in Norton Sound, where they would not only be able to investigate these rumours, but also to acquire a knowledge of the Esquimaux tongue.

I then proceeded to the Russian settlement of Sitka, where we were most kindly received, and obtained some useful information relative to the course of the river Kwichpak or Kweipak or Yucon; the latter name having been erroneously appended to the Colville, thus affording it a watershed nearly equal to the Mackenzie, whereas the drainage of this district falls into Behring Strait, instead of the Polar Sea.

Leaving Hong-Kong on the 2nd of April, 1851, we found the whaling fleet* at the edge of the ice, near Cape St. Thaddeus, on the 1st of June, and immediately entered the pack, in the hope of finding land-water in the head of the Gulf of Anadyr.

With some difficulty we managed to push through up to Cape Chukotsky, and then, with considerable labour, effected our passage across to Port Clarence, where we arrived on the 3rd of July, and had to receive the melancholy intelligence of the death of Lieut. Barnard, who with the governor of Derabin (a Russian post in the interior) was killed by the Indians, thus depriving the expedition of one of its most promising officers, whose life was sacrificed in an attempt to open a communication with the Esquimaux on the shores of the Polar Sea by way of the Colville.

Taking leave of civilized society we bade adieu to our friends in the Plover, and sailed on the 10th of July, meeting with a considerable quantity of ice, but no obstruction, until we reached Wainwright Inlet, where the "pack" did not admit of a passage for us between it and the land. While waiting for it to open we were beset, and after undergoing considerable pressure were carried gradually towards Point Barrow; on approaching which, we found the current increase in velocity, but the ship remained immovable in the pack, and we were thus borne along by the current towards a mass of grounded ice, on which the Point Barrow natives had assembled, evidently in anticipation of the rich prize which was almost within their grasp. The eddy tide caused by the grounded pieces proved, however, our refuge, and it was with no small feelings of gratitude that I perceived none of the

* *i.e.* American.

floating pieces of ice touched the grounded ones, but were turned aside as they came up. This happened to us: at one time we approached within our own length, but by the merciful providence of God were again carried away without collision, in which case destruction appeared inevitable.

After passing the grounded masses, the ice slackened, but we made little or no progress until the 31st, when we reached the coast water near Point Tangent.

During the period we were beset, an opportunity was given us of observing the dispersion of boulders by the ice. Three stones the size of a man's head were alongside on a floe, when we were 10 miles from the land: as there are no icebergs in these seas, these could not be torn away from the cliffs, but must have been embarked by pressure on the beach.

We proceeded slowly along the coast, contending against light easterly winds, but occasionally assisted by rain-squalls from the S.W., which sometimes raised the temperature of the air as much as 20°, and on one occasion came to our aid at an opportune moment. Desirous of extending our narrow lane of navigation between the ice and the land, we approached the latter too close, and in the act of going about took the ground, when one of these puffs occurring, saved us the labour of laying out a stream anchor.

We were twice boarded by the natives, who brought venison and geese, which they eagerly bartered for tobacco; and from a doll in their possession, which was part of a boxful equipped especially for our use by some kind friends, and therefore must have been received from us last year at Point Hope, it is evident that the natives of this part of the coast are in the habit annually of resorting to Behring Strait for barter. The coast line is fringed with low sand-banks, between which and the main are shallow lagunes, which seldom afford water sufficient to float their oomiaks. Many reindeer resort to these sand-banks, both for the purpose of avoiding ambuscade and escaping from the torment of musquitoes.

Although the navigable channel was sometimes barely wide enough to work the ship in, yet we met with no detention until our arrival at Point Manning, where it threatened totally to obstruct our progress; fortunately we found a passage, and then the effect of the Mackenzie became visible, the ice sometimes admitting us to stand 50 miles from the main, at which distance no bottom was obtained with 180 fathoms.

We were detained by light wind and a surface-current (which turned the ship round and round in spite of all our endeavours to the contrary) a week opposite to Herschel Island. At length a fair wind carried us past the embouchure of the Mackenzie. The Pelly Isles were seen from the crow's-nest, and two islets to the E.N.E.

of them, the water about them being apparently very shoal from the number of grounded pieces of ice. Cape Bathurst was made on the 26th of August, and Cape Parry the same afternoon. In the first watch we made the land out to the northward, and hauled up towards it, finding ourselves the following day at the entrance of a strait. This we followed, and on the 30th came across traces of our consort, who, it appeared, had wintered in the pack in this neighbourhood, and ascertained that the strait communicated with Melville Sound. Without information regarding Capt. McClure's intentions, or any knowledge whatsoever of the direction his travelling parties had explored, I imagined he would most naturally pursue the north-eastern route. We accordingly made all sail in that direction, and reached the entrance of the strait, where, in lat. $73^{\circ} 30' N.$, and long. $114^{\circ} 35' W.$, some imagined they saw Melville Island, but, I must confess, I did not make it out. *There remained, however, but 55 miles between our position and the farthest point reached by Sir E. Parry in the Hecla in 1819*—to so short a distance is the North-West Passage now reduced, but, I fear, without a chance of its being ever accomplished in this direction.

Capt. McClure may be said to have watched it three years without the ice breaking away; while the assiduous attempts of the eastern expeditions, with the aid of steam, have not even been able to reach so far to the W. as Parry did in 1819, thus showing how uncertain the navigation of these seas is.

The ice to us appeared in unbroken fields, which the north-easterly wind was now pressing on to the shore at each side of the strait, affording us, under present circumstances, not a hope of egress; but, anticipating that on a change of wind the ice might slack off, I hauled over to the N. shore, where I had seen a small cove in which the ship could remain while we examined the ice from the land. This on our return we found full of ice, which had streamed in since the previous day; and, after in vain looking for a sheltered spot, until we were too near the depôt of provisions left by Capt. McClure on the Princess Royal Isles, I determined on proceeding up the W. face of Baring Land, and finding a place there to winter in, whence our travelling parties could explore westerly and north-westerly, but little imagining I was pursuing the exact track of the Investigator. On reaching Point Kellett, however, we found this to be the case, and learned that she had left the Prince of Wales Strait, but *13 days previous to our entering it*. From the quantity of provisions deposited on the Princess Royal Isles, I, in default of any information, concluded that Capt. McClure had returned to Point Barrow; but as the sea was still open, I determined upon following the coast line as far as I was able, and depositing depôts for my travelling parties' return to

Point Kellett, where the configuration of the land promised to afford us shelter for the winter. On the 9th of September we reached Meek Point, where the large floes obstructed the navigation so much as to render it nearly impossible to work to windward, and the main body of the ice was so close that the first westerly wind would cut off our retreat. I therefore landed some provisions and returned to Point Kellett, as it appeared, just in time; for in the westerly wind which ensued the ice closed in upon the Investigator, placing her in a most perilous position.

On examination, the depth of water inside Point Kellett did not admit of the ship's being placed there in security. I had, therefore, to abandon this intention, and seek another locality. This was found at the entrance to the Prince of Wales Strait, where, in lat. $71^{\circ} 35' N.$, and long. $117^{\circ} 39'$, we passed the first winter.

A party of Esquimaux, about 40 in number, were hunting in our neighbourhood, where they remained until November, and then migrated to the southward. In May the same party returned; so it is probable that they reside on the shores of Dolphin and Union Strait during half the year, where the tides are sufficiently strong to break up the ice and give them an opportunity of catching seals.

Before starting on our exploring parties, a journey was undertaken into the interior, with the hope of reaching an eastern water-parting; but the summits of the hills were so denuded of snow that the runners of our sleigh were cut to pieces by the stones, and we were compelled to return without attaining our object.

Two of our travelling parties passed through the Prince of Wales Strait, when one sleigh followed the N. coast of Albert Land, which I was desirous to examine, in order to judge whether a route in that direction was practicable for the ship.

The second crossed over to Melville Island; but having, from the rough condition of the ice, left the tent and sleigh behind, they did not reach so far as Winter Harbour.

They landed on Cape Providence *twenty days after Capt. McClure had left it*, and saw his sleigh-tracks; but deeming the easterly route the most recent, and hearing the howling of dogs, they were taken to be Esquimaux. Being ill provided with arms and ammunition, and their provisions exhausted, they were compelled to return; and thus, although we had passed within *sixty miles* of the Investigator, and had fallen upon the traces of her exploring parties, we again missed the opportunity of communication.

The southern travelling party entered the sound which separates Albert from Wollaston Land, but did not reach the bottom of it; and as this appeared likely to lead me into the centre of the Archipelago, I determined to ascertain whether it was a sound or strait,

which its close proximity afforded a probability of doing without materially interfering with the season. We got to sea on the 5th of August, but being hemmed in by the ice did not lose sight of the spot where we had spent our winter until the 5th of September; and it was the 13th before the junction between two lands was satisfactorily determined: then, the season being too far advanced to hope that any good would result from our again trying the Prince of Wales Strait, we entered the Dolphin and Union, and after a hazardous navigation among rocks and shoals, embarrassed by the difficulty of not knowing how to steer during the darkness and the fogs, we reached Cambridge Bay on the 26th of September, and were frozen in on the 30th. The winter came upon us in a critical position, the ship being on shore; but, with considerable labour and great exposure, we managed to get her afloat—the exertion on this occasion proving, however, a bad forerunner to the severe winter which ensued, the mean temperature for February being as low as -38° .

On our arrival, we at once established a communication with the natives, who were diffident at first, this being their earliest communication with white men. The number hunting in the immediate vicinity amounted to less than 100, but before the winter set in others resorted to Cambridge Bay, attracted no doubt by the wonderful novelty. They belong to the Central tribe of Esquimaux, wearing the same costume and speaking a similar dialect to the Igloodik and Boothia Isthmus people; and unlike the Greenland and Behring Strait tribes, who perform almost all their migrations by sea, these people travel over the land and ice with sleighs. The journey to Victoria Land is performed previous to the breaking up of the ice in the summer, and having no oomiaks, and but one or two kayaks, their communication with the continent is cut off until the straits are bridged over by the frost; they then assemble between Cape Colborne and the Finlayson Islands, which is the great crossing-place for the reindeer, and, after they have obtained as many as possible, pick up their caches of fish and venison, and return to the continent for the winter. They frequently visited us, bringing children of all ages even upon the coldest days, but we only could induce them once to remain all night, when they enjoyed the dancing and singing upon the lower deck, and went to rest perfectly satisfied. Unfortunately, the following morning was the usual one for the weekly inspection of the men under arms; and after breakfast, when the ship's company began to take down their muskets and cutlasses, they became alarmed, and crept away before we were aware of it. Otherwise they were upon very good terms, becoming latterly expert in picking up whatever they could lay their hands upon, and occasioning the necessity of a vigilant look out.

In addition to their performing their annual migration on land instead of by water, they differ from the other tribes by inhabiting snow houses during the winter, and have therefore no fixed place of abode, all their necessities being carried upon sleighs. The house is built in the course of two or three hours, and all trace of it disappears in the ensuing summer. Very few iron implements were found among them, the most warlike being a spear-shaped knife made of native copper; while their arrows are tipped with the same, or made of bone and flint. On one occasion they were induced to show their skill by shooting from the fore-castle at the mast-head vane, and struck it frequently. They seldom cook their food, the frost apparently acting as a substitute for fire. Biscuit and sugar the children latterly acquired a taste for, but salt appeared always an abomination.

They do not use drift-wood or grass for fuel, but content themselves with the stone-lamp fed by seals' blubber, which enables them to thaw the snow for a drink. Spirits and tobacco they have as yet no notion of; and, unlike their brethren on the E. and W., are free from vermin on their persons. A distance of several years was always observed to intervene in the ages of the children of the same family, which must be occasioned, I presume, by the difficulty of supporting them. All the drudgery falls upon the women; even the boys would transfer their loads to their sisters. Bears' claws, deer's teeth, and bills of birds are hung about their coats; the mothers frequently pointing with pride to these evidences of success in their children. The limited means of communication which we possessed prevented our ascertaining whether any form of religion existed. One man of the tribe lived by himself in a tent, and appeared to be regarded as the *Angekok*. The dresses, with the exception of those of the young girls and children, who use bear-skin, were made almost entirely of rein-deer skins sewed together with sinew by copper needles. Some of the men were tall and well made; the distinguishing features being a broad face, square forehead, and flat nose; hair coarse and black, no whiskers, and but little on the upper lip and chin. The women are generally low of stature, and disfigured on the cheek by tattooing. Among those seen the preceding year were a few with aquiline noses and a Jewish cast of countenance, forming a curious contrast with the remainder of the tribe. The tribes appear to be separated from each other by a neutral ground, across which small parties venture in the summer for barter. The limit of these people westerly appears to be the Dolphin and Union Strait, beyond which the costume alters—the *oomiak* and the labret appear, showing an immediate connexion with the Behring Strait tribe. They do not, however, extend all the way to Point Barrow, but terminate at Herschel Island, whence, in the summer, trading

parties resort to Barter Island, where they meet not only the Point Barrow people, but also the Rat Indians, who descend from the Hudson Bay Company's post, Fort Yucon, and barter muskets, powder, beads, and knives, for furs. A party of these Indians were brought on board by the Esquimaux just as we were leaving Camden Bay, in July, 1854, when they at once produced a note from Mr. Hardisty, the clerk in charge of that post.

In the spring we set off in the hope of attaining the point reached by Sir James Ross in 1849, and thus complete most thoroughly the search; but owing to the ice hummocks and consequent necessity of following the coast line, we only reached an islet in $70^{\circ} 25' N.$, from whence *no land* was seen to the northward, and the ice being impracticable for sleighs, we were compelled to return, being 160 miles short of the object. I believe a better road would have been found, had we at once crossed over to King William Land; but being unaware that the east coast of Victoria Land had been searched by Dr. Rae, I thought this side of greater importance. This is now so far unfortunate as it would probably have led to the discovery of some traces of the party from the missing ships; and as the *Enterprise* was only 150 miles from Simpson Strait, where the remains of our unfortunate countrymen are supposed to be, we could have reached the spot, and paid the last sad offices to those whose lives it had been our great object to rescue during the preceding years, and perhaps have ascertained the cause of their untimely fate.

On one of the Finlayson Islands in Cambridge Bay, a piece of wood (part of a door frame), with a copper latch having the broad arrow upon it, was found. As this has been ascertained not to belong to Dr. Rae's boats, the probability of its having come from one of the two missing vessels is exceedingly great, and must lead to the conclusion that the vessels were abandoned somewhere in the vicinity of the Magnetic Pole. The depôt at Fury Beach never having been visited by them, is, I think, a conclusive reason for assuming that they were deserted to the southward of 72° ; and it should be borne in mind, in addition to Peel Inlet, there may be a strait between the points reached by Wynniatt and Osborn. The extreme difficulty which we experienced in dragging our sleighs in Victoria Strait would compel them to carry but a small quantity of provisions; and my opinion now is, that the main body of the survivors were left on the seashore, where they would have a better opportunity of maintaining themselves, while an advanced party ascended Back River, with the hope of reaching the Hudson Bay posts, and gaining assistance; but that in this attempt the boat was upset in one of those dangerous rapids so well described by Sir George Back. It is most painful that the mystery is not yet unravelled, and although all, or nearly all,

have abandoned the hope that any survive; yet the return of the searching party, which is now on its way to Simpson Strait, must be looked forward to by many with intense anxiety.

We remained incarcerated by the ice until the 10th of August, when it suddenly disappeared, passing away to the eastward, and leaving Dease Strait free. *The probability of our egress by Peel Inlet appeared to me quite as feasible as the western route, but upon examination, it was found that from some error at Woolwich we were 18 tons of coal short.* I had, therefore, no alternative but to make the best of my way to a coast where drift-wood could be found; we accordingly retraced our route, and met with no obstruction until opposite the embouchure of the Coppermine, when we found the channel blocked, and in our endeavours to get through were frequently in great peril, being beset and carried in the pack among the numerous islets and rocks with which this channel abounds. At length, with the loss of two anchors and 140 fathoms of chain, we effected our escape from the Dolphin and Union Strait, and had the satisfaction of being able once more to put trust in our compasses, and steer the ship in fogs and cloudy weather without risk of losing our way.

On arrival at Cape Bathurst, instead of the open sea which existed at the same period two years previous, we found the pack resting on the shore, and had considerable difficulty in getting through it. From thence, with less obstruction, we reached Herschel Island, but were here again brought to a standstill, until a westerly wind dispersed the ice, and with great difficulty we got at length into Camden Bay. This was fated to be our resting-place for the third winter, as at its western horn the ice was closely packed upon the shore, which an easterly wind was continually augmenting; and while waiting with a hope that a change in its direction would loosen the pack, the frost came and cemented all together. With the exception of spirits and a small deficiency in tea and sugar, we had an ample supply of provisions; and as soon as the ice would bear, set to work to lay in a stock of fuel for the winter. The beach was covered with drift-wood, and as it had to be dragged 4 miles off to the ship, the shortness of the days prevented our making more than one trip. We succeeded, however, in obtaining a sufficiency, and then settled down to our winter occupations. The season fortunately proved mild, and the general state of health was equal to the first and superior to the second year. When the spring advanced, I undertook a journey to the N., in the hope of settling the Polynia question; but although lightly laden, our sleighs broke down, and some of the men receiving severe falls from the hummocky condition of the ice, induced me to abandon the journey; and then the ascent of the Romanzoff mountains was undertaken, whence I hoped to

obtain an extended view to the northward. But in this we were also disappointed, in consequence of the prevalence of foggy weather, and the difficulty of travelling after the thaw commenced, all the water-courses being flooded.

On the 2nd of July the Esquimaux arrived from Barter Island, and we obtained from them some papers printed on board the Plover, by which we learnt that that vessel had passed the winter of 1852 at Point Barrow, and that the Investigator had not been heard of since 1850. As it was probable she had not made her escape the last season, it was determined at once to open a communication with Capt. Maguire, so as to enable him to collect provisions in time for us to return this season; and when the land-water admitted, which was the 10th of July, the whale boat under Lieut. Jago was despatched to Point Barrow. After a great deal of labour he reached that spot on the 24th, and found the Plover had sailed two days previously. The boat was so much damaged by being launched over the ice, that it was not prudent to return; he accordingly remained until our arrival. While waiting for us, the Rattlesnake stood in to the Point, but the weather being too bad for the boat to go off, she was not seen; and Capt. Trollope finding the Plover had sailed, returned without having noticed the boat's signals. *This slight occurrence prevented our being in the ice at the present moment, as on board the Rattlesnake they were not aware at that time that Capt. McClure had communicated with the eastern expeditions, and as there was provision for two years on board of her, we should have completed and returned to the eastward.*

The ice broke off alongside the ship on the 15th of July, but it was the 20th ere a navigable channel was found round Point Brownlow, and then we made but slow progress to the westward owing to contrary winds. On our route we fell in with the Point Barrow natives on their way to Barter Island, who immediately came on board, addressed me by name, and said Maguire had told them to supply us with provisions. A brisk barter immediately took place, and among other things a file of the 'Illustrated London News,' containing the opening of the Great Exhibition, was produced, being the first intelligence we had received from England since January, 1851!

On the 8th of August we reached Point Barrow, and having picked up our boat, made all sail to the southward; and on the 11th fell in with five American whale-ships, and reopened our communication with the civilized world after an interval of 1126 days.

When the result of our observations upon the moon-culminating stars, which have been obtained at each of our winter quarters, is ascertained, I will communicate to the Society the geographical

positions established by the *Enterprise*, and will conclude this paper by a few remarks upon the navigation of the sea that is now thrown open.

From the absence of field-ice and icebergs, the entrance by Behring Strait to the Polar Sea will always be found less hazardous than that by Davis Strait; and, in my opinion, the great difficulty lies between Icy Cape and Point Barrow. When the latter is rounded, although exposed to detention, yet the voyage may be considered as secure; and in the event of a vessel not being able to reach a sheltered harbour before the winter sets in, the security in which we passed the winter of 1853 on the open coast affords good reason to think that the ice hereabouts remains stationary; but the vicinity of the Mackenzie or Point Barrow should be avoided unless shelter from the land can be obtained.

Between Icy Cape and Point Barrow we found a current setting continually to the N.E., but along the American continent, the Prince of Wales and Dease Strait, the current is governed by the wind, while in the Dolphin and Union Strait a regular ebb and flow occurs. The tides seldom rise 3 feet. A synopsis of these and the meteorological observations will accompany the geographical positions. A large collection of specimens in natural history, which have been lodged in the British Museum, has been made by the surgeon, Mr. Anderson. While we must all lament that the noble object on which we were sent was not attained, we have the answer of a good conscience on our part that no means of affording aid to the missing ships was left untried, and that the search was continued to the uttermost our means afforded.

Geographical Positions established by Her Majesty's Ship Enterprise in the Polar Sea.

The accompanying longitudes are based upon the results of moon-culminating observations at the following places, viz.—

						h.	m.	s.
Walker Bay	172 observations	..	..	..	..	7	50	27.05
Cambridge Bay	134	..	..	..	..	7	0	2.76
Camden Bay	138	..	..	..	..	9	41	49.98

The meridian distances obtained by the chronometers (five in number) are as follows:—

						h.	m.	s.
Port Clarence to Walker Bay,	interval 70 days	..	..	..	..	3	14	24
Walker Bay to Cambridge Bay	.. 65	..	..	..	..	0	50	9.01
Cambridge to Camden Bay	.. 54	..	..	..	..	2	41	4.29
Camden Bay to Port Clarence	.. 39	..	..	..	..	1	23	52.51

By which it will be seen that there is an error of 24', or 6 miles, in the longitude brought back to Port Clarence; and as it is difficult to determine where this error occurs, I have preferred retaining the result of each culminating station to referring the whole of the observations to one particular spot. The artificial horizon was frequently used on board the ship, the smoothness

of the sea sometimes admitting of its use, even when the vessel had a rate of three knots through the water. But some of the positions are liable to a slight uncertainty, either from being overseen observations or deduced from the rate of a pocket chronometer during our sledge operations.

Name.	Spot.	Latitude.	Longitude.
		° ' "	° ' "
Point Barrow	N.E. angle	71 24	156 13*
Cape Halkett	Islet	70 30	152 13
Sandbank off the Colville	River	70 34	150 27
Sandbank off Yarrowborough	Inlet	70 30	148 17
Flaxman Island	N.E. point	70 11	145 44
Mouth of the Canning	W. cliff	70 6	145 32
Manning Point .. .. .	.. .. .	70 6	143 41
Herschel Island	N. point	69 40	139 0
Kay Point .. .. .	.. .. .	69 20	138 9
Pollen Island .. .. .	.. .. .	69 39	134 5
Cape Bathurst	N. end	70 28	127 30
Cape Parry	N.W. end	70 5	124 32
Point Meek	Islet	72 44	124 40
Point Kellett	W. end of spit	71 57	125 25
Nelson Head	E. end of cliff	71 4	122 21
Ramsay Island	Summit	71 36	119 3
Princess Royal Isle	Summit	72 49	117 48
Point Peel	Investigator's post	73 22	114 31
Cape Wollaston	End of the point	71 5	118 8
Cape Baring	Ditto	70 1	117 12
Bell Island	Summit	69 39	116 33
Lambert Island	Ditto	68 43	114 5
Cape Krusenstern	Cliff	68 28	114 48
Murray Point .. .. .	.. .. .	68 42	109 52
Turnagain Point .. .. .	.. .. .	68 43	108 28
Cape Alexander .. .. .	.. .. .	68 54	106 9
Simpson Rock .. .. .	.. .. .	69 1	105 1
Mount Pelly	E. Cliff	69 5½	104 45
Gateshead Island .. .. .	.. .. .	70 25	100 36

XIV. — *Account of the Jimma Country.*

Communicated by Sir J. GARDNER WILKINSON.

Read, June 13, 1855.

[The following is an account of the Jimma country given me by a native whom I met some years ago in Egypt. He had been carried off as a slave, and was taken to the Port of Berbera, from which he was sent to Mákha, and afterwards to Cairo.—J. G. W.]

On going into the interior towards the S.W. from the port of Berbera, you traverse the Somául country, then that of Adderay, beyond which is the Jimma district. This is the name given it by the inhabitants; the Gallas call it Warági (Warakee). It lies to

* From the Plover's observations.

of the sea sometimes admitting of its use, even when the vessel had a rate of three knots through the water. But some of the positions are liable to a slight uncertainty, either from being oversea observations or deduced from the rate of a pocket chronometer during our sledge operations.

Name.	Spot.	Latitude.		Longitude.	
		°	'	°	'
Point Barrow	N.E. angle	71	24	156	15*
Cape Halkett	Islet	70	50	152	18
Sandbank off the Colville ..	River	70	34	150	27
Sandbank off Yarrowburgh ..	Inlet	70	30	148	17
Flaxman Island	N.E. point	70	11	145	44
Mouth of the Canning	W. cliff	70	6	145	32
Manning Point .. .. .	.. .. .	70	6	143	41
Herschel Island	N. point	69	40	139	0
Key Point .. .. .	.. .. .	69	20	138	9
Pullen Island .. .. .	.. .. .	69	39	134	5
Cape Bathurst	N. end	70	28	127	30
Cape Parry	N.W. end	70	5	124	32
Point Meek	Islet	72	44	124	40
Point Kellett	W. end of spit	71	57	125	25
Nelson Head	E. end of cliff	71	4	122	21
Ramsay Island	Summit	71	36	119	3
Princess Royal Isle	Summit	72	49	117	48
Point Peel	Investigator's post ..	73	22	114	31
Cape Wollaston	End of the point ..	71	5	118	8
Cape Baring	Ditto	70	1	117	12
Bell Island	Summit	69	39	116	53
Lambert Island	Ditto	68	43	114	5
Cape Krusenstern	Cliff	68	28	114	48
Murray Point .. .. .	.. .. .	68	42	109	52
Turnagain Point .. .. .	.. .. .	68	43	108	28
Cape Alexander .. .. .	.. .. .	68	54	106	9
Simpson Rock	69	1	105	1
Mount Pelly	E. Cliff	69	5½	104	45
Gateshead Island	70	25	100	36

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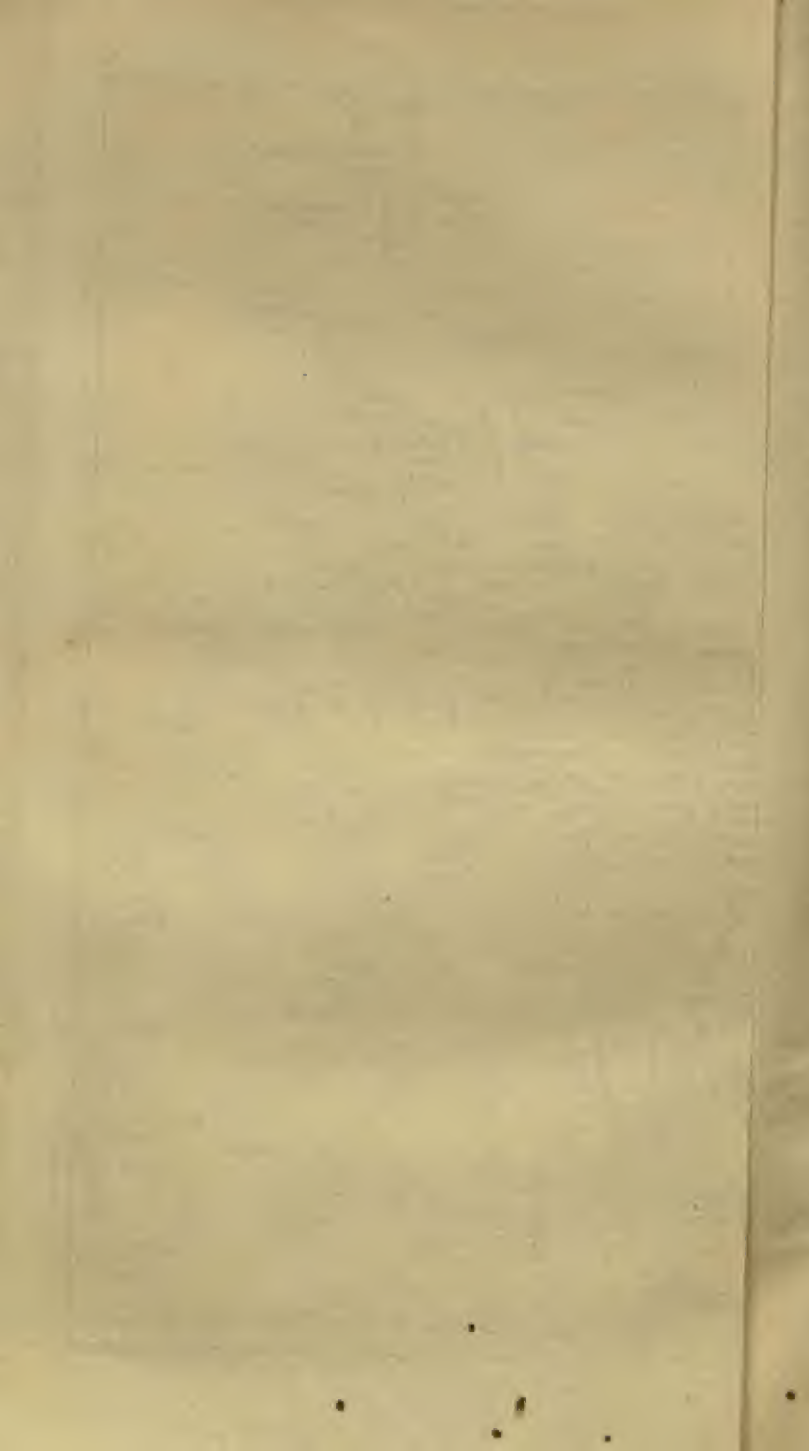
* From the Plover's observations.

Sketch
of the shores of
Arctic America,
to illustrate
THE VOYAGE OF SIR JOHN FRANKLIN
by
Cape Collinson of H.M.S. Enterprise
1850-1854.

Sketch of Cape Collinson by H.M.S. Enterprise

Sketch of Cape Collinson by H.M.S. Enterprise





the southward of the Gallas, and extends a considerable distance to the east, south, and even westward of them, but principally to the S.E., where it is separated from them by the branch of a river of great depth, with very high banks, but of little breadth, as they make rude bridges over it with beams of wood about 3 feet wide: it is called Eedja, or Ija, signifying "river." It comes from the southward; but its course is afterwards westerly, though how far it is from its source, or how far it runs on leaving the Jimma country, I could not ascertain. Another branch of it bounds the country to the eastward, beyond which is part of the Galla territory. The water is very clear at all seasons, from the rocky ground over which it flows, except during winter, when the rains make it muddy. There is another river of great size, which you cross in going from the Jimma country northward (not in the Galla district), and here it divides into two streams, one running eastward and the other northward: it is the Bahr-el-abiad or White river.

The Ija runs through a hilly country, which is covered with trees and verdure, but uninhabited, owing to the vicinity of the Gallas, the enemies of the Jimma people, who are always at war with them. For some distance to the southward the country is level, and again in the northern part also, being the principal arable land they have, and the most populous portion of the country. Their houses are either scattered about singly, according to the pleasure or convenience of the owners, or are clustered together in villages. They are round and of wood, the roofs thatched with straw; but the richer class of people thatch them with a kind of coarse grass dried in the sun, in the centre of which, on the outside, they place one or more ostrich eggs, frequently stained green. In the middle of the house is a large pillar of wood, from the upper part of which radiate rafters (like an umbrella), strengthened by several concentric hoops, to support the framework of the roof; but there are neither windows nor chimney, and all the light is admitted from the doorway. The door is made of large split reeds; it turns on pins, one in the ground, the other in the wooden lintel of its arched summit. The walls are of planks, placed upright in the ground and held together by ropes made of a sort of *leef* (*momordica lufa*), bound at intervals to a horizontal beam inside and to a corresponding one on the outside of the wall, the chinks between the planks being filled up with clay. Their tools, for these and other operations, are the saw, axe, file, &c., all of which are made in the country; but no nails are used by them except of wood. The interior of the house is whitewashed, or painted of some colour—the outside alone preserving the appearance of wood. They often build a series of houses adjoining each other, which are then like a succession of chambers, and the door of the second one can only be opened by a person in the first or outer room. This is done by

means of a long bar fitting into the wall, across and outside the second door; and the third is closed by a similar bar in the second room, and so on throughout the building to the last door. A suite of rooms of this kind is often built by some of the rich people, and a married man builds an extra chamber for his wife. The floors are covered with mats made of the stalk of the *máz* (banana) or of the papyrus (at least of some large species of *Cyperus*), which grows wild there, and the only parts paved are the stable and cow-house. Houses in the villages are also built separately, with a court before each, and sometimes with sufficient regularity to form streets of considerable width; but from the houses being scattered over a great extent, the market is held in a different place every day.

The Jimma people have a great number of cattle, sheep, and goats, which constitute their chief property; but they do not buy with them nor barter them for other things; and for buying and selling in the market they have two kinds of money. One consists of small bars of silver, fastened together in fours, which, however, may be separated if the price of the commodity bought only amounts to one or two. Large sums are paid in masses of copper, which are taken only by weight. The Venetian sequin is also current among them, and of great value. Their cattle are all humped and long horned. The buffalo is wild, very savage, and never in a tame state, so that it excites surprise to see children driving and riding upon them in Egypt: they are only killed for their hides.

The other animals are elephants, lions, leopards, hyenas, wolves, foxes, hares, apes, monkeys, gazelles, porcupines, ostriches, &c., but no camels. Donkeys are employed only for carrying burdens, but never for riding, which would be considered the greatest disgrace, as it is also in Abyssinia. Mules are used for riding, but only by women and woodcutters; and the horse is looked upon as the proper animal for the saddle. They have no plough, merely a long two-pronged wooden instrument, shod with iron, to turn up the ground, and a hoe or mattock, made of a single piece of wood with four (sometimes only two) teeth, also capped with iron, to break the clods. The productions of the country are cotton, bearded wheat, and another grain which supplies the place of and resembles rice, or a sort of millet, the grains growing in pairs up the ear, and only on two sides of it; also barley of several kinds (the *dúra* or *holcus sorghum* and the *hommos* or vetches being imported from the Gallas), peas, beans, lentils, sugar-cane (merely used for eating, not for making sugar), flax, &c. But linen is not made from the flax, though they manufacture cotton stuffs. Of fruit-trees there are the palm, the *Naring* or Seville orange, peaches, apricots, *NebAh* (or *Rhamnus Nabeca*) figs, sycamore figs,

and a sort of blackberry, but no vines. They have also pomegranates, of which they eat the green leaves, and by their keeping them merely as bushes for this purpose, the fruit never comes to maturity; but the most useful of all is the banana, which furnishes great part of their food. Their mode of planting it is this: they cut down one of them, leaving about half a foot above the ground; they then dig it up, and having split the short stem into four parts down to the roots, they fill the fissures with earth and plant it again with the roots uppermost, covering it all over with soil, and from this spring up a number of young sprouts, each forming a new tree, which when grown up they separate and transplant into other beds, leaving the old stump to die. They grow to a great size, and the leaves are cut off and chopped up as fodder for cattle; but the fruit is thought of no value, and though there are several kinds, the use they are applied to is the same, which is to furnish their staple supply of food. When a tree is required for this purpose, they dig it up, and having cut off the root they strip this of its rind, and then cutting it into slices and boiling it, they eat the inner part. The trunk is also peeled, and being placed upright against a plank, is scraped with a sharpened piece of reed, by which the fibrous *leaf*, called "*leaf Hegdizee*" at Cairo, is obtained, and the juice and pithy substance are collected into a large pan. This last being pressed, the liquid is thrown away, and the pithy residue is placed in a pit lined with banana leaves and the rind of the root, where it is kept closed for thirty days. The pit is then opened, the substance is turned over and pressed, and the pit closed again for four months. They then beat it with the shoulder-blade of an ox, selecting the finer parts and extracting all that is fibrous, and this being done, they keep it covered up for use. It is always soft and moist; and a piece of it is taken and formed into loaves and baked like an oatmeal cake on a girdle, not of iron, but of glazed tile. This is the best quality. It may also be used fresh after two or three days' or even one day's keeping; but it is then very inferior. A sort of reed, like a bamboo, also grows there, the leaves of which are used for making umbrellas in the rainy season. Their chief food is milk and vegetables, the banana bread and cheese, and now and then meat. This, if cooked, is very little done: they also eat raw meat, which is chopped up, and butter, salt, and pepper are thrown over it. Several trees have medicinal properties, many of which appear to be known even at Berbera. One bears a fruit like black pepper, which is pounded and mixed with water when required. It is called *andôt*, or *andôte*. Another, which is strong in its effects, is in appearance like the *sont* (*mimosa Nilotica*), and is called *abbagoóra*. The bark is boiled, and the juice, which comes off red (like logwood), is as odious to children

as rhubarb is in Egypt. The santon also grows there, as well as a medicinal tree, called *sáyto* or *séto*. This is of the size of the sycamore fig, with broad leaves, and a flower growing like a bunch of grapes, which when dried and pounded is used as medicine; the dose being one tablespoonful in a glass of cold water, with the decoction of marsh mallow roots. It is even sold at Berbera and Mókha.

The mountains appear from the description to be of grey granite, but of no great height. Snow is never seen on them, and the country generally is hill and dale, the hills covered with much wood and verdure, and with habitations. There are many small streams which run into the Ija. The heavy rains and hail fall only in winter, the rainy season lasting then four months; but in summer there are only a few showers. During the rains all the cattle are housed and fed on grass and banana leaves, laid up beforehand; and the stock of wood for burning is also collected before that season. The climate is healthy, though children are subject to diseases of the eyes: but these seldom attack grown persons; and they are never visited by the small-pox, plague, and other diseases of Egypt.

There is a particular earth brought from the mountains for sale, which the cattle eat, and of which they are so fond that they will go a great distance in search of it. It is of a greenish colour, and seems to be of a talcose quality.

The population, though far inferior to that of the Galla country, is considerable; and besides the real inhabitants are a tribe of blacks in the mountain districts, who are pagans, and use poisoned arrows. But they live very peaceably, and are not in sufficient numbers to molest the community, on whom they depend either for charity or for some employment. They are the "hewers of wood and drawers of water," and help in various ways in the fields; but they live apart from the other people, and are barbarous in their habits and naked, with the exception of a piece of cloth round their loins, descending below the hips. In religion the Jimma people are Christians, though some few are Moslems, having learnt something of the Prophet and the Koran from the Jellábs; and their language, which contains more Arabic words than any dialect of Abyssinia or Galla, has been affected by the same means.

Every young man is expected to go out to battle, and almost all are mounted. If a man has no horse, he receives one from a richer neighbour, to whom he has to pay in return half his prize of booty. The leaders are the chiefs, who perform the part of generals and captains. The arms of the Jimma are a spear, a curved dagger or *yataghán*, a sword slightly curved, and a shield of elephant's hide, about three folds in thickness. Some dress in the

skins of leopards or other animals, some in calf or goat skins, with the hair on, sewed into the shape of the body; but their costumes vary according to caprice.

When a man overcomes his adversary and intends to spare his life, he orders him, after he has been disarmed, to take hold of his horse's tail and follow him, which is the sign of submission and of quarter being given and accepted. He is then bound to remain a prisoner until ransomed, though he is not a slave and no service is required of him. In the mean time his family, having received intelligence of his fate, collect his ransom, which is generally about 700 heifers, and if he has not that number himself, his friends contribute to make it up; but should no ransom be forthcoming, the captor has the right to make him his slave, in return for having spared his life.

They have black slaves, bought from the *Jellábs* (slave-dealers) of the interior of Africa, and white slaves also; but it does not appear from what country these come.

In order to accustom boys to the use of arms, they give them shields of palm branches stuffed with coarse grass, and sticks for swords; and the use of the shield and skill in throwing the spear are the chief requisites for a young warrior. In riding and managing horses they are also instructed when very young, and the number of horses is only surpassed by that of their cattle, of which some idea may be formed from the fact of 700 heifers being required for the ransom of one prisoner.

When a young man wishes to marry, he despatches one of his relations to the girl's father with presents, and if accepted, he sends her a necklace, a ring and bracelets, or bangles, by which she becomes engaged to him; and to entertain proposals from any other person would then be considered a breach of promise. Matters being thus far arranged, several other damsels, her friends, go every day and dance and sing at her house. The young friends of the suitor also hold festive meetings at his house. But the parents of the girl and the relations on both sides studiously avoid each other. When the time approaches to within about a month, the girls assemble in the house of the fiancée, and after some days her *wokéel*, or sponsor, who is appointed by her suitor, rides with a number of young men to her house, where they are welcomed with great festivity. While enjoying all the good things provided for them, the damsels sing a number of songs, in which the suitor and his friends are abused in unmeasured terms. They pray that "every calamity may befall him before he sees his bride; that he may be killed, and that death may be his medicine," &c. The young men on their side abuse her and her parents in a similar manner, and declare she is unworthy of her betrothed, with nume-

rous reproachful remarks. This is repeated day after day; but all is done in good humour and only with pretended anger, and at length the sponsor takes her, mounted on a horse and covered with a silk dress, to the bridegroom's house, where she is ushered into the chamber he has there built expressly for her, as he then leaves his father's abode and sets up one of his own. Here again festivities are held every three or four days, and in the evening monkeys are seated on a shelf in the dining-room, each holding a torch of some resinous wood to light the party; in return for which they are fed after the company retire. Sometimes a restive monkey throws down his torch, to the great consternation of the guests; for which misdemeanor he receives many stripes and no supper. But they are generally very docile, and in the houses of the rich they are kept as dogs in other countries, trained to various employments, and making excellent guards, dogs not being very common.

The burials of the Jimma are very simple. The body is deposited in a pit in the earth, and the women mourners only *ululate* in the house, not in the streets, as in Cairo. Their lamentations continue about fifteen days. The black pagans also bury their dead.

The chief ruler or governor of the country is called *Noox Gilgilay*, who dispenses justice and governs the people; but he does not go out to battle, though his sons are expected to do so. He is attended by an armed force; he has power of life and death; all criminal cases are decided by him, and no one can be punished without his consent. His house is of wood, like all the rest, though larger; and in like manner there is no capital city, though some towns are larger than others. Of their laws the most severe are those against murder and theft. When they discover an offender he is not only seized and put to death, but all the members of his family and relations are supposed to be partakers in his guilt, and at night their houses are surrounded and all burnt together. Even their cattle, corn, and trees are all destroyed, and nothing is left of them or their property. They generally, however, escape this cruel and wholesale sacrifice of the innocent for the guilty, by making presents to the relations of the deceased.

In their professions and occupations the son follows that of his father, whether he be a peasant or a fighting man.

The ordinary costume of the men is a cotton garment, either single or in several folds one over the other, sometimes of three folds sewed together, and it is worn exactly as the Moorish blanket, or *haik*. The women wear a girdle round the waist, and a similar one is adopted by the peasants and by the fighting men also, who, laying aside their long dress, wear a smaller one of similar form

tied at their neck and fastened by a girdle. At other times they wear the skins before mentioned, which are also adopted by the poor classes. Their head is uncovered and anointed with fresh butter; on which account they do not sleep on cushions, but rest the neck on head stools (like those found in the ancient Egyptian tombs), the hair falling over on the other side. These headstools are of wood, and often highly ornamented, especially when they belong to newly married brides. They have a long pin of wood for arranging the hair, similar to that used by the Ababdeh Arabs. Their traffic is among themselves and the Gallas. Even cheese, butter, cattle, and grain are sold; but milk and bread are not sent to market. The productions of other countries are brought by the *Jellábs*, as of Arabia, and of Amara (*i. e.* "Christian") or Abyssinia; thus looking-glasses and even telescopes are known, as well as fire-arms. They also trade with the port of Berbera, which is famed for its cattle fairs. In their houses they have small wicker-trays, similar to those in Nubia and Upper Ethiopia, on which the plates and dishes are placed at meals, these being of glazed or vitrified ware; but the Gallas eat out of a large bowl, like the Arabs. They have no tables: their chairs are of wood, the back of which takes out. Their saucepans and boilers are of glazed earthenware; but they have no copper utensils, and their knives are of iron with wooden handles. They seldom use *kohl** for the eyes, but hennah† for the hands very frequently. They do not tattoo any parts of the face or body, as in Egypt, where a little *kohl*, with the green leaves of the *sesabán*,‡ are applied to different parts of the chin, hands, arms, and legs, after having been punctured with needles. They have an umbrella in the form of a shield, with a curved summit, made of the rind and leaves of two large reeds, and supported by strips of the rind tied together, and held by a handle like that of an ordinary shield. It is of great use in the rainy season; and for the sun they have a parasol of a long shape, also made of reeds.

As in many other parts of Africa, the rainmaker is a personage of great importance, whose powers of calling down rain whenever it is wanted are universally believed by the people, and his services are always eagerly sought when a fire happens in their very combustible houses.

The Jimma have a great hatred of the Gallas, with whom they are constantly at war; and no greater affront can be offered them than to comprehend them under the name of Gallas, which is considered almost as great a mistake as to call these last and themselves Abyssinians, or *Hábeshec*.

* Antimony.

† *Lawsania spinosa et inermis* (Linn.).

‡ *Sesbania Egyptiaca* (Persoon).

Having mislaid the list of words in the Jimma and other dialects, I can only give the following imperfect vocabulary:—

Jimma.	Galla.	Adderay.	Semaut (Soud).
God—Ullah (<i>Arab.</i>),	Wäg.	Allah (<i>Arab.</i>),	Illah (<i>Arab.</i>).
Heaven,	Wäg.		
Earth—Duccay, Duchäy,	Luffa,	Duccäy.	
To-day—Owjay,	Hattatoko.		
Day—Owjay,	Hatta.		
To-morrow,	Bôro.		
Day after to-morrow,	Ifân.		
Day after the day after to-morrow,	Ifân döôba.		
Morning—Fegger (<i>Arab.</i>),	Ganama,	Fegger (<i>Arab.</i>).	
Mid-day,	Gwêca.		
Night—Aröd,	Ëkun.		
Sun—Eir,	Ádoo,	Eir.	
Moon,	Jeca.		
Stars—Kufbajo,	Orgee.		
Darkness,	Dóokana.		
Light,	Ëefa.		
Wind,	Gillénsa.		
Rain,	Bókayn.		
Clouds,	Gwüjée.		
Water—Mai (<i>Arab.</i>),	Beesín.		
River—Ëeja, ïja,	Abbdia.		
Large river,	Abbdia goodda.		
South,	Olee.		
Year—Áido,	Ogga.		
One year—Adda aido,	Ogga tokko.		
Two years—Hoit aido,	Ogga lamma.		
Man,	Tóera,	.. ..	Hin.
Woman,	Néetee,	.. ..	Hákta.
Boy,	Góorba.		
Girl,	Éstalo.		
Come—Na, nei (<i>fem.</i>),	Kólto,	.. ..	Kálly.
Go away—Need,	Dágay.		
Hallo!	Yateesatéenna,	.. ..	Werrea.
Batter,	Tatta.		
Milk,	Annen,	.. ..	Sóbnk.
Fire,	Ibidda,	.. ..	Feir.
Meat,	Pohn, ñon,	.. ..	Hellib.
Donkey,	Arrag,	.. ..	Damer.
Horse,	Ferda.		
Sit down {Tagóobel,	Tei (Ty),	{Tagóobel,	Feréeso.
Get up—Negga,	Kei (Ky),	{Tagummeto,	
		Negga.	

XV. — *Memorandum on Abyssinia.*

Communicated by the FOREIGN OFFICE.

Read, March 12, 1855.

In speaking at all of Abyssinian institutions, it must be remembered, as a general key to their peculiarities, that the form of government and its military spirit are feudal, whilst in the laws and customs the Jewish institutions are everywhere traceable.

The title of Ras signified, in the times of prosperous and hereditary succession, the prime minister and commander-in-chief of the emperor, and the highest rank in the empire.

The Ras now claims the right, as then possessed by him, of appointing all other chiefs of provinces and officers of every kind at his will and pleasure; and, having a sufficiently commanding force at his disposal, is, in fact, master and king of the country; the form even of consulting the emperor having been disregarded for many years.

Amidst the conflicts, however, of great families, whose members claim the hereditary chieftainship of different provinces, and whose name will at any moment conjure into existence a numerous army for rebellion or rapine, the Ras is obliged to employ a subtle and tortuous policy, rather than violence, to retain his control over those fierce warriors, his equals by birth, impatient of a superior, and, in some instances, sufficiently powerful to be nearly independent. The resemblance is apparent to the times of Louis XI. of France and his rebellious vassals.

Each chief holding the rank of Dejazmatch (quasi Duke), appointed by the Ras—or as often only obtaining his consent after a successful contest with his own immediate rivals—is entire master of all sources of revenue within his territory, with full power really of life and death, theoretically vested in the Ras alone. His feudal subjection consists in the obligation to send, from time to time, some presents to his superior, and to bear his shield—that is, to follow him to war with as large a force as he can muster; against private enemies he is generally expected to defend himself. He takes toll from all merchants passing through his district.

The immediate troops of the Ras consist of a number of petty chiefs, governing one, two, or more villages, who imitate, as far as they dare, the independence of the greater barons, and who take the field, when called on, with 5 or 500 men, according to their means.

Besides these (who are numerous) the Ras has his matchlock men, and four or five bands of rude and disorderly soldiery, his guards.

From the lax system of government, and the manner of paying these men by quartering them on the country-people, with instructions to levy so much grain or other property, it may be supposed that these undisciplined troops, when at a small distance from the camp, are almost equally independent of the Ras, and frequently are simply organized bands of robbers, the rather that, after the commission of any profitable crime, they have but to reach the camp of some great feudal chief, at a distance from the Ras, and, by entering his service, obtain perfect immunity; or, would they enjoy in case their spoil, take shelter in the nearest well-reputed church, which is inviolable as the city of refuge of the Mosais law.

Regarding the collection of duties, each chief claims them as part of his revenues, excepting those levied at Gondar, Adowab, and a few other towns, collected by an officer called the Negadeh Ras, who pays a fixed sum yearly to the Ras or Obeay, and extorts as much as he can from the merchants for his own profits.

Custom-houses, or rather passes, have been established in Abyssinia on every spot where nature, in that mountainous country, has confined the road to some narrow defile, not to be avoided without an immense *détour*, if at all, and near some commanding elevation where a good look-out can be stationed, or perhaps at a brook fordable only at one spot; and as the different chiefs sometimes give orders on the sudden to allow no one to pass, great trouble ensues, not only to merchants, but to all wayfarers. Frequent quarrels and even deaths occur at these posts, always kept by armed men, and it requires no little temper and knowledge of the country to avoid these inconveniences, or to send messengers, &c., to any distance in safety.

A merchant starts from Massowah for Basso, the last mercantile station to the southward of Christian Abyssinia. He pays at Massowah the import or export duty to the Turkish governor; he must then engage a guide from the Shohas, an independent tribe inhabiting the hills near the coast, and in possession of the only passable roads, winding through defiles for 50 or 60 miles. According to the agreement made and his appearance, wealthy or otherwise, he may pay this guide from 10 dollars to half a dollar. Arriving then in Obeay's dominions, he will be stopped four or five times before he reaches Adowah, and on each occasion must arrange with those in charge of the tolls as he best can as regards payment, the amount being arbitrary, and the system, in fact, one of legalised plunder. On arriving at Adowah he pays certain more regulated duties to the Negadeh Ras of that town, a *donneur*, moreover, being expected, as the price of a friendly settlement of dues. After meeting the exactions of several minor posts, he will next have to pay at the town of Dobaruk, in the province of Waggera, duties on the same scale with those of Adowah, generally one dollar per mule-load of merchandise; and being then clear of the territories of Dejazmatch Obeay, enters those of Ras Ali, whose tolls commence at Gondar. Here the duties are nominally somewhat settled, though long disputes almost invariably occur; and, after three or four more detentions and payments on a smaller scale in Begender, he passes the Nile, and arrives in the domains of the chiefs of Godjam or Dannot. These may be in a state of entire rebellion or of sulky submission to the Ras. As in the latter case they pay him a fixed tribute, he does not interfere with their toll-levying, and the merchant must disburse at some eight or ten more stages of his journey ere he can reach "Basso."

A code of laws, called the "Feth Negust," said to have been compiled by the Council of Three Hundred in the earlier ages of the Church, and regarded originally as almost of equal authority with the Sacred Writings, is the guide of the Abyssinian chiefs in their decisions as judges. The twelve "licks" of Gondar originally formed the supreme court of justice, a court of final appeal, but the office ceased with the power of the emperors. The Feth Negust is now expounded by some learned priest or scribe, and there are few in the country competent to the task. It is frequently consulted more after the fashion of the 'Sortes Virgilianæ,' the book being opened with much solemnity, and the first passage found that seems to bear upon the question being hastily dressed to suit the case in hand and present an aspect of oracular wisdom. In this light it is at least regarded by the uninformed multitude, that is, the whole nation, save the priesthood; and it is invariably set aside when the passions or whims of the presiding chief seem to require it.

On the accusation of any man in Abyssinia of any crime, he has the right to be heard in the first instance by his own judge, that is, either the chief of his village, or the master to whom he is attached for the time being, and to be forwarded to his residence, together with his accuser, by any authority to whom he shall appeal in the King's name.

Strangers may be judged by the district chief or the chief paramount, as they may choose. In every way the final right of appeal to the supreme ruler

exists; but the Ras not being strong enough at present to enforce this right in the case of Obeay, the decisions of that chief are considered final. The chiefs of the Agows of Lasta, called the Wagshum, and the chiefs of Kivora, on the borders of Sennaar, although feudally subject to the Ras, claim also this privilege of final judgment; but with these exceptions, the greatest chief may, on the complaint of a peasant, be summoned from any distance to appear at the Ras's court, and be obliged personally to answer the charge before the "Af-a-negus" (or "king's mouth"), an officer who hears all cases, and reports them concisely to the Ras for his verbal decision.

After an accusation, before the pleadings can commence, both parties must give security, approved of by the Af-a-negus. These bails or securities are answerable for the execution of the sentence, whatever it may be, or must suffer it themselves should the principals abscond. But at the end of the trial these first securities may declare off in case of doubting their principals, and others must be found, the only alternative to the convicted party being chains.

In all suits, civil or criminal, there is no prosecution by the Crown, and no police of any kind. The party aggrieved must lay the accusation, find out the aggressor, seize him, and convict him as he best may.

The Mosiac law of blood for blood being in full force, when a man is convicted of having killed another, whether purposely, by accident, or in self-defence, he is handed over to the relatives of the deceased to be put to death by them, unless they can be persuaded to accept the blood-money, a similar sum being also paid into the royal treasury. It not unfrequently happens that no relation is found sufficiently near of kin to interfere in the matter, and the homicide then escapes scot-free. With the greater chiefs there is generally a desire to administer justice impartially, when not embarrassed by some political motive.

The power of the chief of northern Abyssinia dates nearly from the overthrow of the Abtyee, or emperor of Gondar, by Ras Michael.

The present Ras, though no other chief is powerful enough to encounter him in the field, can only retain his title by the maintenance of a large army and constant wars against his rebellious vassals. Of all the inferior chiefs, whose title is Dejajmatch, the greatest is Dejajmatch Obeay, who, partly by the concurrence of the Ras, and more by subtlety, fortune, and the force of arms, governs with absolute sway the country from near the coast of the Red Sea to Gondar, and from Lasta to Sennaar—the only conditions that should prevent him from being regarded as an independent sovereign being his title of Dejajmatch, held from the Ras, and the payment of a tribute of money to him yearly as his feudal superior; otherwise the Ras does not interfere with his rule over these vast provinces, by which he commands every avenue to the interior of the country available for trade or policy.

The Ras has been engaged in the siege of a hill-fort in Godjam for four years; and another chief in rebellion, after gaining two battles, has pillaged Gondar, and rendered all communications with Godjam circuitous or dangerous.

It is now doubtful if the Dejajmatch Obeay will be faithful to his allegiance, or rebel in the hope of seizing the supreme power. In the latter case the whole land will bristle with arms, and all communication become impossible.

The boundaries of northern Abyssinia, at present defined as the districts inhabited by Christians, do not reach, by 90 or 100 miles, to the Red Sea at any point. This interval is occupied by various more savage tribes: the Adael, the Arobo Gallas, the Areyia Gallas, the Danakil, the Fultals, the Shobo, the Habab, and the Amb tribes of the Beni Amir. These have adopted, more or less strictly, the Mahometan faith, and are all, excepting the Gallas, wandering tribes, living by their flocks or their camels, governed by no master, and occupied with incessant feuds or combats.

Through the district occupied by the Shoho is the nearest and the most practicable route to Abyssinia. It is indeed the only one desirable, seeing that it bears directly on Massowah, the only good harbour, as I believe, in the Red Sea from Sowakin to the Straits of Bab-el-Mandeb.

These tribes of Shoho furnish guides to all passers for half a dollar each, and even conduct a party for the same sum. Rich native caravans pay according to their numbers, but always moderately, and a white man is of course considered fair booty, to be fleeced according to the extent of his ignorance or his fears. Though vexations by their delays, they are never known to rob or ill-treat any voyager. They fulfil strictly their contract of safe conduct through their territories into Abyssinia, and no reasonable man can find fault with their moderate charges for this. It is true that occasionally the Faltal tribes make an incursion and plunder travellers not well-armed, in spite of the Shoho, watching their opportunity when the warriors of the latter tribe are engaged elsewhere; but this impugns not their good faith, having never been suspected of collusion.

They acknowledge no superior save the elders of their tribe in council, now that the Naibs of Arkiko are politically extinct.

The Turkish Government occupying the island of Massowah, their Pasha here claims also the coast for 50 or 60 miles inland, and forces various feeble tribes in those limits to pay tribute; but, in return, affords them no protection when devastated by the Shoho or the ruthless soldiery of Obeay. These people are therefore sufficiently miserable and poor.

XVI.—*Explorations into the Interior of Africa.* By the Rev. DAVID LIVINGSTON, LL.D. (*Gold Medallist.*)

(Continued from Vol. XXIV.)

Extracted from communications to the FOREIGN OFFICE from E. GABRIEL, Esq.; to the LONDON MISSIONARY SOCIETY; SIR RODERICK MURCHISON; Consul BRAND, and others.

Read, Jan. 8 and Nov. 12, 1855.

Pango Andongo, 31st Dec., 1854.

[THE letter marked No. 1. is a copy from memory chiefly of one I sent under date of August last, which, with a map of the country travelled over, I have lately heard, was lost in the destruction of the 'Forerunner' off Madeira. I had the fever so frequently after leaving Cassangé, that I could only take latitudes, inserting them and my route in pencil, and I promised to send a better map of Angola back from Cassangé on my return. This I shall do from the last point to which the postal arrangements extend. I have been detained some time here reproducing the letters lost in the 'Forerunner'; and I leave for Cassangé to-morrow morning.

I naturally feel some little regret at the loss of my map, for, believing it safe in your hands, I had been rather free in giving away latitudes, longitudes, and sketches of the country, some of which have been copied and sent to other parts, and I have some ambition, as I am the only one who ever made astronomical observations in this part of the world, that my own country should have the preference. At present I give the following list:—

	S. LAT.			E. LONG.			REMARKS.
	°	'	"	°	'	"	
Golungo Alto	9	8	30	14	59	21	Mean of seven lunar observations at the residence of the Commandant.
Confluence of the Luinha and Luce rivers	9	15	0	14	49	0	In Cazengo district. The longitude is approximate.
Confluence of the Luinha and Lucalla	9	26	21				
Confluence of the Lucalla and Coanza	9	37	50				Port and town of Massem-gano is on this confluence. I could obtain no lunars, but I have bearings for an approximate longitude.
Ambaca	9	16	35	15	23	15	At the residence of the Commandant.
Pungo Andongo	9	40	35				The residence of Mr. Piris on the south side of the rocks.
The Fort	9	40	0	15	33	40	The longitude from three good observations.
Coanza River, at a point S.S.W. of the Fort of Pungo Andongo	9	47	3				
Cassangé	9	37	29	17	43	30	From many observations.
The Quango river	9	51	28				At the ford 150 yards wide.
The Chikapa river ..	10	38	0				Flowing W.N.W., 60 yards wide.
Confluence of the Chihund and Louge	10	57	31	20	29	30	Both small streams. Canoes on the latter.
The Casai (Kasye) or Loké (at the ford) ..	11	17	0				Flowing N.E. and E.N.E., 120 yards broad.
Lake Dilolo, source of the Lotembwa, between	11	30	0				W. end is $\frac{1}{2}$ mile broad.
	11	32	0				E. end is said to be 6 miles broad. Same longitude as Katema.
Katema town	11	35	37	22	47	0	Near the river Lotembwa.
Lotembwa river, crossed in	11	40	0				Above 100 yards broad.
Soana Molopo village ..	11	49	42	22	52	0	3 miles N.N.W. of the ford on the river Lokaloye.
Leeba river, crossed in	12	8	0	22	55	0	Flowing here from E. to W.*

1. *Journey from the Confluence of the Leeba and Lecambe to Loanda.*

To Sir Roderick Impey Murchison.

Pungo Andongo, Angola, 24th Dec., 1854.

SIR,—I have been in the habit of addressing my letters for the Royal Geographical Society to the care of Lieutenant-Colonel

* Dr. Livingston's latest astronomical observations have since been received from Mr. Maclear, and will be given in the next Journal.—Ed.

Steele, but, from some notices which I have seen in the newspapers since my arrival in Angola, I conclude that that gentleman has gone to the seat of war in the East. On that account, and knowing the interest which you take in such matters, I beg you will allow me the liberty of sending my communications on geography to you.

In my last letter, dated 20th September, 1853, I reported my return to the town of Sekeletu, on the river Chobé, after having visited the country of the Barotsé, and the river Leeambye or Zambesi as far N. as its confluence with the Leeba; I enclosed also a sketch of the river, with the latitudes and longitudes of the different points at which I had made observations; and mentioned my intention of proceeding to Loanda, in order, if possible, to open a path whereby commercial intercourse might be maintained with the west coast, as a means of ameliorating the condition of the people in the interior. The present communication is intended to convey a sketch of the journey from the point at which my last terminated—viz., the confluence of the Leeba and Leeambye, lat. $14^{\circ} 11' 3''$ S., long. $23^{\circ} 40' 30''$ E.—to Loanda, the capital of the Portuguese possessions in Western Africa.

Sekeletu, who, by the abdication of his sister, now possesses the chieftainship, and the principal men of the tribe, entered cordially into the project of opening a new road for commercial purposes.

The commerce of the country over which Sekeletu now reigns, and that of numerous tribes situated more to the E., have been until lately completely neglected by Europeans. A large waterfall, called Mosioatunya, is conjectured to have prevented the Portuguese from ascending the Zambesi; and the Desert presented an insurmountable obstacle to commercial enterprise in the south. Accordingly, when we first visited the country we saw many instances in which valuable ivory had been allowed to rot with the other bones, just where the animal had fallen. Indeed, tusks went by the name of "mere bones" (*marapobela*=bones only); and, though the inhabitants soon acquired an idea of their superior value, they have not, up to the present time, received prices sufficient to stimulate them to proper efforts to procure large supplies. Elephants abound in the land, and there are many daring hunters; but a few pieces of cloth present only a very small indication that the tusks are of more value than the flesh. The elephants have always been killed more for food than for profitable barter; and other articles of trade, such as beeswax, which abounds in some parts of the country, are thrown aside as useless.

The common methods of killing elephants may be mentioned. The hunters having observed the path by which certain elephants or a herd go to water, select the highest overhanging trees as best adapted for their purpose. They are armed with spears having

very long handles, made of very light wood, and blades about two feet long, furnished with a barb on the shaft. As the animals generally drink during the night, the men perch themselves on branches hanging nearly over the path, and, when the elephant comes unsuspectingly along, plunge their spears into his body. The wounded animal rushes madly away, and, as the spear is held in by the barb, the motion of the body causes the long handle to swing in different directions. Contact with trees produces the same effect; and, as the motions of the blade are uniform with those of the handle, the numerous internal gashes soon bring this strong animal to the ground. Another method is by means of a log of wood, having a poisoned spear-head inserted. It is suspended on a branch above the elephant's path by means of a cord, which again is secured to a small wooden catch on the ground. When the catch is touched by the foot of the elephant in passing along, the beam falls on his back, and the barbed spear-head remains. In this case the trust of the hunter lies in the poison. Still another method is that of deep, wedge-shaped pitfalls, carefully covered over and plastered, so as to have the same appearance as the rest of the path. Many females and young animals are destroyed by this last means; but it is evident that with better arms and the prospect of a speedy and profitable sale of the ivory, much more produce would appear. The present means are often rendered futile by one elephant helping another out of a pitfall, or by the sagacious beast snuffing danger in the wind, and abruptly leaving the country. Even when successful, it can only be with one animal, for the others at once forsake the district if one of their number falls a victim.

A variety of considerations having induced me to try Loanda first, Sekeletu showed his cordiality by furnishing men, oxen, and canoes; and, being desirous of ascertaining the value of ivory among the white men in that direction, he committed four tusks to our care for the purpose, which we subsequently disposed of at Cassangé to his advantage. Taking leave of the chief and principal men on the banks of the Chobé, my company consisting of none but men of Zambesi, and these chiefly Barotsé, we descended that tortuous river to its junction with the Leeambye, which we ascended, visiting Sesheké and the different villages on its banks, at each of which orders had previously been issued "that we must not be allowed to become hungry." On reaching the country of the Barotsé, we learned that a foray had been made by one of the under-chiefs, and that several villages had been destroyed in the very direction we intended to take. Having demanded the return of the prisoners, as the only means of ensuring our safety, I succeeded in getting eighteen into my charge, and these were restored to their relatives as we approached their different habita-

tions in our progress up the river. As we had previously seen, the Leecambye makes a sharp bend away to the eastward from the confluence of the Leebe, and flows from E. to W. But the Leebe comes from the N., so we supposed that by ascending it we should approach the source of the Coanza, and, by descending the latter, might at last reach Loanda. We discovered afterwards that the Portuguese map, which represents the Coanza as rising in the E., is erroneous. With the above impression, however, we ascended the Leebe for 40 or 50 miles, when a cataract preventing farther progress in canoes, we remained a few days waiting for a party which had been detached at the confluence, before commencing the journey on oxback. The party was sent from the junction with five captives belonging to Masiko, a Barotsé chief, who lives E. of that point, and proceeded in the same direction during five days. Two of the prisoners being little girls, shorter marches than usual were made; and the actual distance may, therefore, be not more than 80 miles. Though travelling eastward thus far, the party did not again come near the Leecambye. From this, and the fact that we could get no more information about it in the north, it may fairly be inferred that this noble river, the Leecambye, holds an easterly and westerly course for a considerable distance beyond where we left it.

The party having returned together with an embassy of Masiko's principal men, bearing a present and friendly message, we left the river, and proceeded N.N.W. through a portion of the country called Londa, the paramount chief of which is well known to the Portuguese by the title of Matiamvo. The inhabitants, called Balonda, belong to the true woolly-headed negro race, and differ remarkably from the Bechuanas and other tribes in the south in their treatment of females and in the practice of idolatry. They swear by their mothers, and never desert them; they allow the women a place and voice in their public assemblies, and frequently elevate them to the chieftainship. Near every village we observed an idol, consisting either of an image formed of grass and clay, intended to represent a lion or alligator,—or a block of wood, on the top of which the human face was rudely carved. In cases of sickness or of non-success in hunting, offerings are made and drums beat before these idols during whole nights. The Bechuanas, on the contrary, swear by their fathers, glory in the little bit of beard which distinguishes them from the sex which they despise, and, though they have some idea of a future state, it exerts but little influence on their conduct. Their supreme God is a cow, and they never pray.

The first Londa chief of importance whom we visited is called Shinté, or Kabompo. His town stands in latitude 13° S. (13° 0' 21"). We were received in what they consider grand

style. The old chief sat under a species of *Ficus Indica*, on a raised seat, having some hundreds of women behind him, all decked out in their best, and that best was a profusion of red baize. Some drums and primitive instruments made of wood, were powerfully beaten; and different bands of men, each numbering about fifty or eighty persons, well armed with large bows and iron-headed arrows, short broadswords and guns, rushed yelling towards us from different quarters. As they all screwed up their faces so as to look very fierce and savage, I supposed they were trying whether they could not make us take to our heels. But they knelt down and made their obeisance to Shinté, which in all this country consists in rubbing dust on the upper and front part of the arms and across the chest. When several hundreds had arrived, speeches were delivered, in which my history, so far as they could extract it from my companions, was given. "The Bible containing a message of peace," "The return of two captives to Shinté," "The opening of a new path for trade," &c., were all described. "Perhaps he is fibbing, perhaps not; they rather thought he was."—"But as they were good-hearted, and not at all like the Balobale, or people of Sकेलेतु, and had never done any evil to any one, Shinté had better treat him well and send him on his way." The women occasionally burst forth with a plaintive ditty, but I could not distinguish whether it was in praise of the speakers or of themselves; and when the sun became hot the scene closed.

Shinté came during the night and hung around my neck a particular kind of shell, which is highly valued as a proof of the greatest friendship; and he was greatly delighted with some Scriptural pictures which I showed him from a magic lantern. The spirit of trade is strong in all Africans, and the Balonda chiefs we visited, all highly approved of our journey. Each expressed an earnest hope that the projected path might lead through his town. Shinté facilitated our progress to the next important chief, named Katema, and we again reached the Leebe, in lat. $12^{\circ} 8' S.$, and $22^{\circ} 55' E.$ long. It had assumed the same easterly and westerly course as the Leeambye. After crossing it we were obliged to go almost due N., in consequence of the plains of Lobalé on our W. being flooded and impassable. It happened to be the rainy season, and never did twenty-four hours pass without frequent drenching showers. All the streams were swollen, so as to appear considerable rivers; but as they were generally furnished with rustic bridges, we may infer their flow to be perennial. Several extensive plains were crossed with the water standing more than a foot deep; and broad valleys also, along which the water flowed fast towards the Leebe, deep enough to wet our blankets, which we used as pads on the oxen instead of saddles.

Both this and the water in the rivers was so clear, that, in using the bridges over the latter, though they were submerged breast-deep, we could easily see the sticks on which to place our feet. This clearness of the water, which we observed in the Zouga, Chobé, and Lecambe, at the times of inundation, is the result of the rains falling on a mat of grass so thick as to prevent the abrasion of the soil. As the tropical rains cause the plains of Lobalé to present a similar phenomenon, it may not be unreasonable to conclude that the water of inundation of the Barotsé valley and lower parts of the Zambesi, is supplied by copious rains in the north, and, as the natives reported, comes chiefly from Lobalé.

We suffered less detention than might be expected from the swollen state of the rivers; for, though we had to swim some of them, all except two boys knew the art; and we never stopped to dry our clothes, unless it were in the afternoons. We got drenched, either by rains or rivers, two or three times every day; but the sun was hot, and we suffered no inconvenience. If, however, we arrived at our sleeping-place damp, or got our blankets wet, intermittent fever was sure to follow.

The more important rivers, or those we crossed in canoes, were the Lokaloye (the village of Soana-Molopo, about 3 miles N.N.W. of the ford, stood in lat. $11^{\circ} 49' 42''$ S., and long. $22^{\circ} 52'$ E.); the Lotembwa, upwards of 100 yards broad, and one of the principal feeders of the Lerba, was crossed in $11^{\circ} 40'$ S. lat. The town of Katema stands a short distance beyond, in $11^{\circ} 35' 37''$ S. lat., and $22^{\circ} 47'$ E. long. The lake Dilolo, from which the Lotembwa takes its rise, is 3' or 4' N. of Katema's town, and consequently may be reckoned in nearly the same longitude, and between $11^{\circ} 30'$ and $11^{\circ} 32'$ S. lat. We went round the western, or smaller end of this lake, where it was not $\frac{1}{2}$ a mile broad; but the other end is said to be broader (perhaps 6 miles), and, as it has large waves, it is probably deep. It contains many fish, and we saw marks of many hippopotami on its banks. Repeated attacks of intermittent fever had at length made me so weak and giddy, that I could with difficulty sit on the ox; and, as Katema did not appear very willing to let me sleep at the broad part, I did not feel much inclined to press the subject. The giddiness and confusion of mind were, combined with the excessive cloudiness of the weather, great annoyances in making observations; but I took as many as possible at every important point. After crossing a water-covered plain beyond Dilolo, we came to streams flowing in a totally different direction from those we had left. These were the feeders of the Casai (Kasye) or Loké, which we found flowing N.E. and E.N.E. The Casai is about 120 yards broad, and flows in a deep valley, finely wooded and beautifully green. The latitude of the ford was $11^{\circ} 17'$ S. The confluence of the

Chihune and the Longe, both small streams (the latter, however, had canoes on it), is $10^{\circ} 57' 31''$ S. lat., $20^{\circ} 29' 30''$ E. long. The Chikapa (lat. $10^{\circ} 38'$), about 60 yards wide, flows W.N.W.; and, when entering upon Portuguese territory, the Quango or Coango, about 150 yards wide, flows nearly due N. The latitude of the ford was $9^{\circ} 51' 28''$. I waited four days for a lunar observation, but in vain, as the sky was always covered with clouds. To these may at present be added Cassangé, the farthest inland station of the Portuguese, where I had a clear sky, and made many observations, lat. $9^{\circ} 37' 29''$ S., long. $17^{\circ} 43' 30''$ E.

The country of the Balonda through which we passed was both fertile and beautiful. Dense forests alternate constantly with open valleys covered with grass resembling fine English meadows. The general surface, though flat, seems covered with waves disposed lengthways from N.N.E. to S.S.W. The crest of each of these earthen billows is covered with forest 4 or 5 miles broad; while the trough, about a mile wide, has generally a stream or bog in the centre, with the habitations and gardens of the inhabitants on the sides. The forests consist of lofty evergreen trees, standing close together, and interlaced with great numbers of gigantic climbers. The trees, covered with lichens, and the ground with mosses and ferns, indicate a much more humid climate than is to be found in the south. The only roads through these dense thickets are small winding footpaths; and as an attempt to stop an ox suddenly, only makes him rush on, we were frequently caught by the overhanging climbers, and came to the ground head foremost. On this account I never trusted to the watch alone for longitudes.

The streams with which the country is well supplied differ remarkably in the directions in which they flow. Many were flowing southwards; but a distance of about 20 miles brought us to streams running N.E., and in much deeper valleys. I suspected that we were travelling on an elevated table-land, because the current of the Zambesi and other rivers was rapid, and we had large Cape-heaths and rhododendrons, which grow on elevated positions, together with a wonderful lack of animal life. This proved to be the fact, for when we were about 40 miles E.S.E. of the Quango we came upon a sudden descent, perhaps about 2000 feet, which to me seemed about the same height as Table Mountain at the Cape. Ninety or one hundred miles W. from this descent appeared as it were a range of mountains; but it is only the edge of similar table-land, identical with that on the margin of which we stood. This presents the same mountainous appearance to a person coming from the west. The intervening valley is called Cassangé, and through it flows the Quango and other rivers.

Only when we reached the declivity which forms the valley of Cassangé could I conceive why all the rivers that flowed N., N.E., or N.W., ran in much deeper valleys than those which followed an opposite course. The slopes down to the feeders of the Casai and Quango are more than 500 yards long and pretty steep, while the beds of the branches of the Leeba are never more than 10 yards below the level of the surrounding country. The whole valley of Cassangé seems to have been a work of denudation, for on all sides the declivity presents the same geological peculiarities, viz., a covering of brown hematite, mixed with quartz pebbles, lying upon bright-red friable clay slate. This, differing only in hardness and paleness of colour, continues to the bottom; but towards the centre of the valley it takes the form of argillaceous schist. A detached mountain, 7 or 8 miles S.S.W. of Cassangé, called Kasala, and having perpendicular sides all round, possesses the same structure. I regret much having no instruments to measure the elevations of these parts; but, after ascending again at Tala Mungongo, we appeared to descend again all the way to Ambaca, where we met primitive and secondary rocks, the latter containing metals.

This country, as compared with that to the S., is well peopled. We came to villages every few miles, and often passed as many as ten in a day. Some were extremely neat; others were so buried in a wilderness of weeds, that, though sitting on the ox in the middle of the village, we could see only the tops of the houses. There is no lack of food; manioc or the tapioca plant is the staff of life, and requires but little labour for its cultivation. The seasons seemed to allow of planting or reaping all the year round. The Balonda were all extremely kind; and, indeed, had they been otherwise, we should have starved; for there is no game, and all the goods which I had brought from the Cape were expended before we started, excepting a few beads.

When we came near to the Portuguese possessions, the tribes altered very much for the worse; and the Chibiqui so annoyed us by heavy fines levied on the most frivolous pretences, that we changed our course from N.W. to N. This did not relieve us long, for, when we came nearer Cassangé, we found our route obstructed by the M'bangala, who demanded payment of "a man, an ox, or a gun," for leave to pass at all. A refusal on our part was sometimes followed by a whole tribe surrounding us, brandishing their swords, arrows, and guns, and tumultuously vociferating their demands. The more we yielded, the more unreasonable the mob became, till at last, in order not to aid in robbing ourselves, we ceased speaking, after telling them that they must strike the first blow. My men, who were inured to fighting by Sebituane, quietly surrounded the chief and councillors. These

felt their danger, and usually became more amicable. They never disputed the proposition that the ground they cultivated alone belonged to them, and all the rest of the country to God. This being the idea in the native mind, they readily admitted that they had no right to demand payment for treading on the soil of our common Father. But they pleaded custom; "slave-traders always gave them a slave." My companions being all free subjects of Sekeletu, had as good a right to give me as I had to give one of them; and the affair usually ended by our agreeing to give each other food in token of friendship. I had to part with an ox; and their part of the contract was sometimes fulfilled by sending us two or three pounds of the meat of our own animal, with many expressions of regret at having nothing else to give. It was impossible to avoid laughing at the coolness of the generous creatures. I had paid away my razors, shirts, and everything I could dispense with; but, though I showed these extortioners the instruments and all we had, as being perfectly useless to them, the oxen, men, and guns still remained. "You may as well give what we ask for, as we shall get the whole to-morrow, after we have killed you;" or, "You must go back from whence you came, and say we sent you;" were some of the witticisms, which, with hunger, were making us all sulky and savage. If Sekeletu had allowed my companions to bring their shields, I could not have restrained them; but we never came into actual collision, and, as far as we are concerned, the way is open for our return. On the last occasion on which we parted with an ox, objections were raised against one which had lost his tail, because they imagined a charm had been inserted in the stump, which might injure them; and the remaining four, still in our possession, very soon exhibited the same peculiarity of their caudal extremities. Attempts have frequently been made by the Balonda and other distant tribes to open up commercial intercourse with the Portuguese, and these have always been rendered abortive by the borderers.

In order not to tire you with a longer account of vexations which were making us misanthropic, and more anxious to pass than visit a tribe, I may mention that, having in the beginning of April reached the banks of the Quango, which was swollen, and its muddy waters flowing rapidly, I had at length made up my mind to part with my blanket and coat to the ferrymen for a passage. But a young Portuguese serjeant, Cypriano de Abreu, made his appearance, and enabled us to enter Portuguese territory without further annoyance. Senhor Neves of Cassangé performed a brother's part to me in the time of need, and indeed the Portuguese everywhere exhibited the greatest kindness all the way to Loanda.

I approached Loanda labouring under severe illness, and ex-

tremely anxious as to what I should do for the support of my companions, who, without exception, are the best I ever travelled with; and who bravely followed me, though told by the blacks of every village W. of Cassangé, that "the white man was taking them down to the coast for sale, and they would all be taken on board ship, fattened and eaten."

I arrived in the city nearly knocked up, and suffering from fever and dysentery. Edmund Gabriel, Esq., Her Majesty's Commissioner for the suppression of the slave trade, most generously received me and my twenty-seven companions into his house. I shall never forget the delicious pleasure of lying down on his bed after sleeping six months on the ground, nor the unwearied attention and kindness, through a long sickness, which Mr. Gabriel invariably showed. May God reward him! My companions were struck with awe at the sight of a city, and more especially when taken on board Her Majesty's ships of war. The kindness of the officers of the cruisers removed the last vestige of fear from their minds, for, finding them to be all my countrymen, they saw the fallacy of the declarations made to them on the road. They were afterwards engaged in discharging coals from a ship for wages, and will marvel to the end of their lives at the prodigious quantity of "stones that burn," one ship could contain. They previously imagined their own little canoes on the Zambesi the best vessels, and themselves the most expert sailors in the world.

His Excellency the Bishop of Angola, then the acting governor of the province, received my companions with great kindness, and assured them of his protection and friendship, as well as desire to promote commercial intercourse with the country of Sekeletu. He also sent a present of a horse and handsome dress for that chief, and showed very great attention to myself in my sickness. The merchants, too, of Loanda took the opportunity of our return to send presents to Sekeletu; and, as they give much more for the produce of his country than can be or is done by merchants from the Cape colony, it is to be hoped that intercourse with either Cassangé or Loanda will promote the civilization of the interior.

I return, because I feel that the work to which I set myself is only half accomplished. The way out to the eastern coast may be less difficult than I have found that to the W. If I succeed, we shall at least have a choice.

My present intention is to proceed to Matiamvo's town before turning southward. Taking it for granted that I shall come into his good graces, our progress through his country will be comparatively easy, and the route, upon the whole, not much longer than the zigzag way we were forced to adopt in coming here. The only thing which may hinder the execution of this plan

will be the wishes of my companions to return as speedily as possible by the path we already know. It is the first time they have gone into other lands, except for plunder; and they have followed my wishes so implicitly hitherto, it would not be right in me to thwart theirs.

After making any arrangements with Sekeletu that may be deemed necessary, I propose to descend the Lecambye to Quilimane. It may be advisable, in order to avoid the waterfall of Mosioatunya, to cross overland from Sesheké to the river Maniché or Loengé (Bashukulompo river), buy or beg a canoe, and descend in it to the Lecambye. The confluence of the Chobé is only two days distant from the waterfall, but the river is very rocky and dangerous before reaching that point.

In order that, should I succeed in reaching Mosambique or Quilimane, I may not suffer the same dejection of spirits on my approach, I presume to request that any of our officers who may be on that coast, be directed to make inquiries respecting my arrival towards the end of 1855. I am known to some of the subjects of the Imaum of Muscat by the name "Naka" (doctor).

In conclusion I cannot omit mentioning the very great courtesy of the Portuguese authorities; and, as their habitual politeness was in strict accordance with the wishes of the Government of Portugal, it is of the greater value.

Begging to be excused for presuming to make an alternative of you in the absence of my friend Colonel Steele,

I am, Sir,

Your most obedient servant,

DAVID LIVINGSTON.

2. *On the Province of Angola.*

Cassangé, 13th February, 1855.

THE province of Angola possesses great fertility and beauty, and its capabilities, both agriculturally and commercially, are of a very high order; indeed, I do not fear contradiction in asserting it to be the richest in resources of Western Africa.

As I have now had the advantage of passing through the province twice, and have honestly endeavoured to obtain correct knowledge of the country, I venture to give you my impressions, as not calculated to mislead any except those whose general views of the world are much more gloomy than mine.

As we proceed from the coast inland, the country, except in the vicinity of rivers, presents a rather arid appearance. There are not many trees, but abundance of hard, coarse grass. But the low meadow-lands, of several miles width, lying adjacent to the rivers, are sufficiently fertile, and yield annually fine crops of

sugar-cane, different vegetables and manioc (the staff of life through all this part of Africa), also oranges, bananas, and mangoes, of excellent quality. Proceeding eastwards, we enter on a different sort of country, about longitude 14° E. It is mountainous, well watered with perennial streams, and mollified by fogs deposited from the western winds, which come regularly to different places at different hours every day. Near the Muria we enter dense forests, whose gigantic trees, covered with scarlet or other coloured blossoms, and giving support to numerous enormous climbers, with the curious notes of strange tropical birds, present the idea of excessive luxuriance, and recall the feelings of wildness produced when standing in similar sylvan scenery in the interior of Brazil. The palm which yields the oil of commerce grows everywhere. Pineapples, bananas, and different kinds of South American fruit-trees first introduced by the missionaries, flourish in the woods, though apparently wild, and totally uncared for. Most excellent coffee, from a few seeds of the celebrated Mocha, propagates itself spontaneously in the forests which line the mountain-sides. Cotton of rather inferior quality finds itself so well suited with climate and soil, that it appears as if indigenous. Provisions are abundant and cheap. Ten pounds of the produce of the manioc plant, which, under the *classical* appellation "*Revalenta Arabica*," sells in England for twenty-two shillings, may, in the district referred to, be purchased for one penny. Labour, too, is abundant and cheap; two-pence per day is considered good wages by carpenters, smiths, potters, &c., as well as by common labourers. The greatest drawback the population has in developing the resources of the country, is the want of carriage-roads for the conveyance of produce to markets. The slave-trade led to the neglect of every permanent source of wealth. All the merchandise of the interior was transported on the shoulders and heads of the slaves, who, equally with the goods, were intended for exportation. And even since the traffic has been effectually repressed by our cruisers, human labour for transport has alone been available. This is a most expensive and dilatory system, as the merchants and persons of smaller means, on whose industry access to a proper market would have a most beneficial effect, possess no stimulus for exertion in cultivation. Some use is made of the river Zenza by means of canoes, and considerable trade is carried on between the districts on the Coanza and Loanda by the same means; but the bars at the mouths of both rivers present serious obstacles to speedy transit.

The country still farther inland becomes gradually more open. Ambaca presents an undulating surface, with ranges of mountains on each side in the distance. It possesses a great number of fine little streams, which might be turned to much advantage for

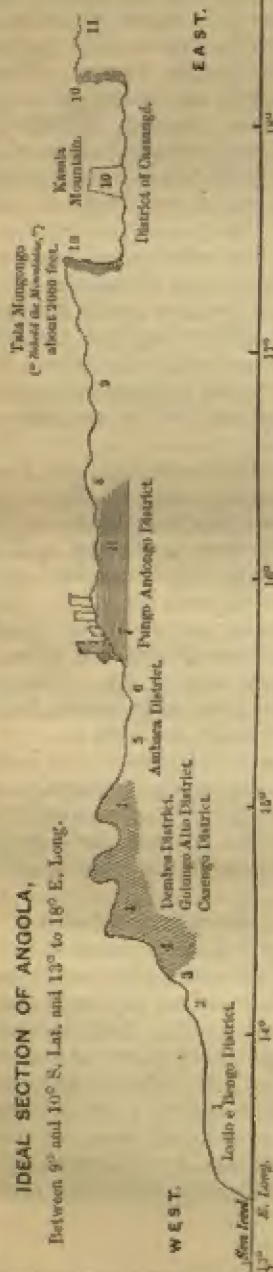
water-power and irrigation. Both it and Pungo Andongo abound in cattle. The latter seems more elevated; for, as we cross the Lotete, the boundary between the two districts, we enter upon the same vegetation and trees which characterise Lunda. Wheat, grapes, and European vegetables, grow in nearly the same spots with bananas and other tropical fruits. Indeed, by selecting proper localities, cotton, sugar, coffee, and other products of hot climates, might be raised to any amount in this fine and beautiful country, together with many of the grains and fruits of colder regions. No attempts have hitherto been made to develop its internal resources. It is but lately that coffee-plantations were turned to as a source of wealth. Some were discovered during my progress, and the actual extent of the tree is still unknown: I saw it at Tala Mungongo, nearly 300 miles from the coast. Different kinds of gum abound, as gum elemi, *India rubber*, &c.: and, among metals, very superior iron all through the country. Rich copper ore exists in the interior of Ambriz, and there are indications of coal.

Cassangé is at present the farthest inland station of the Portuguese. It may be called the commercial capital of the interior. Trade in ivory and wax is carried on with great vigour and success; and large quantities of English cotton goods are sent into the country beyond, by means of native or half-blood Portuguese. The merchants treat their customers with great liberality. At the time I write, Captain Neves is preparing presents, consisting of cloth, beads, carpets, furniture, &c., of upwards of 50*l.* value, for Matiamvo, the most powerful potentate east of this. This chief lives about long. 24°, and monopolises the trade which, but for him, might pass to tribes called Kanyika beyond him.

The deep valley of Cassangé is wonderfully fertile, but success in trade prevents the merchants from paying any attention to agriculture. The soil, so far as present experience goes, would place Mr. Meebi's pipes for liquid manure at a discount, for it requires nothing but labour; the more it is worked, the more fruitful it becomes.

The following is an ideal section of the country between 9° and 10° S. latitude, and 13° to 18° E. longitude, and is sent with a full knowledge of its imperfections. I would scarcely have ventured to remit it at all in its present state, but, having once indulged the hope of forming a geological map of the country N. of the Orange River as far as Lake Ngami, I made a very extensive collection of specimens of rocks for the purpose. As I did not know many of them, while waiting for further information I lost both specimens and papers in the destruction of Kolobeng by the Boers. This misfortune makes me anxious to send any information I can obtain as early as possible. The following additional remarks may be serviceable.

IDEAL SECTION OF ANGOLA,

Between 9° and 10° S. Lat. and 13° to 18° E. Long.

1. Lowlands adjacent to rivers, and extending about 50 miles from the coast; composed chiefly of calcareous tufa and a marly rock, formed of lime and friable clay, containing many sea shells. Modern near the coast; ancient inland.

2. Porphyritic trap, having dark red angular crystals embedded in it.

3. Pale red sandstone, tilted up from the west.

4. Micaceous schist, stratified and tilted

up, at a great variety of angles, but generally from the W. and S.W.

5. Clay slate and sandstone schist.

6. Gneiss, lying under coarse sandstone grit, and occasionally brown basaltic.

7. Large masses of slightly conglomerate, 200 or 400 feet high.

8. Coarse dark red sandstone, with pebbles of greywacke, granite, clay, schist, &c., in beds: the sandstone itself lying in thick horizontal strata.

9. The same sandstone, without pebbles, but having much yellow silica.

10. Soft bright red clay, which gradually becomes harder as we descend to the bottom of the valley. A mountain, called Kasala, near the village Casungu, has the very same structure as the descent.

11. No rocks appear above ground till we approach the Zambezi. The opposite descent has the same red clay structure.

R E M A R K S.

Between 3 and 4 in the district of Cazengo the igneous rocks indicated at 2 have evidently run through gorges in the mountain-ranges 4 4 4 4, and have tilted up schist, gneiss, &c.; and, in the latter, veins may be seen, or rather cracks, filled with a dark blue rock exactly like clay slate. Between 3 and 4, too, in the districts of Cazengo and Golungo Alto, abundance of excellent iron-ore occurs, some strongly magnetic, other parts not, but all very largely impregnated with the metal. To the N. of 2 and 3, near the river Dande, petroleum is reported, and so it is said to occur southwards of 5, from under the dark red sandstone which forms the crust of the country. The spot reported is on the banks of the Coanza, and near Cambambe. Veins of copper appear on the banks of the Coanza in the same district, but I did not see them. The rocks of Pungo Andongo (7) are large masses of conglomerate, about 300 or 400 feet above the surrounding country. They stand in parallel lines nearly N. and S. in direction, and rather more than a mile in length. The conglomerate stands on horizontal strata of dark red sandstone, and this, in a very small proportion to the other materials, forms the matrix. There are granite, gneiss, porphyry, schist, clay, and sandstone, trap, syenite, greenstone, quartzite, &c., all rounded and water-worn, and forming immense masses of shingle. There is also a kind of soft limestone containing sea-shells on the tops of some of the rocks.

The government of the country may be described as a military one, and closely resembles that which Sir Harry Smith endeavoured in vain to introduce among the Caffres. The imposts are exceedingly light, consisting of a tax of eightpence on each hearth, and sixpence on each head of cattle. Something is also levied on gardens near the coast, and on weavers and smiths. The population is large, between 500,000 and 600,000 souls being under the sway of the Portuguese; and of this large number, the majority are free-born. In those districts to the statistics of which I had access, the slaves did not form 5 per cent. of the entire population, and a very large proportion was dependent on agriculture alone. There are very few whites comparatively; and, from the polite way in which persons of colour are addressed and admitted to the tables of the more affluent, it might be inferred that there is as little prejudice against colour as in any country in the world. Nothing struck me as more remarkable than the change produced on convicts by their residence in this colony. No sooner do they arrive than they are enlisted into the 1st regiment of the line, and perform similar duties to our Foot Guards in London. The 11,000 inhabitants of Loanda go comfortably to bed every night, although they know that the citadels and all the arms of Loanda are in the hands of convicts, many of

whom have been transported for life. The officers are not supposed to have been guilty of any offence against the laws of their country, and probably they may have considerable influence with the men; but their testimony even is, that the men perform their duty well, and are excellent soldiers. Some ascribe the remarkable change to the utter hopelessness of escape, the certainty of detection and punishment of any crime, and the fear of being sent to the deadly district of St. José de Encoge (something like our Norfolk Island, but not so bad); but, however accounted for, the beneficial change in the men is unquestionable.

Another pleasing feature in the population is the ability of many to read and write. It is considered a disgrace in Ambaca for a free man of either colour to be unable to write. This general diffusion of education is the result of the teaching of the Jesuit missionaries, who were expelled the country by the Marquis of Pombal. If the results of their teaching have been so permanent, without anything like a proper supply of books, we may be allowed to indulge the hope that the labours of Protestants of all denominations, who endeavour to leave God's word behind them, will be not less abiding.

The commerce of Angola has been remarkably neglected by the English; for, though the city of Loanda contains a population of 11,000 souls, clothed chiefly in the produce of English looms, and though, in many parts of the interior, cheap Glasgow and Manchester goods constitute the circulating medium, there is not a single English house established at the capital. For this anomaly various reasons are assigned: the most cogent of these appears to be, that those who first attempted to develop a trade, unfortunately accepted bills on Rio Janeiro in part payment of their cargoes, at a time when the increased numbers and vigilance of our cruisers, caused the bankruptcy of many houses both in Rio and Loanda. Heavy losses were sustained, and Angola got a bad name in the mercantile world in consequence. No attempt has ever been made since. Still, with the same difficulties and burdens as the English encountered, the Americans carry on a flourishing trade with Loanda.* A very large proportion of the goods imported in other ships are English manufactures, taken in exchange for colonial produce, which has gone by the expensive and circuitous route of Lisbon, *i. e.* produce on which the expense of port-dues, freight, commission, &c., is paid from Loanda to Lisbon, and again thence to London. As the same round of expenses is incurred on English manufactures, a British merchant carrying merchandise direct to and from England, and dealing in Loanda

* The Americans, it is said, do not hesitate to co-operate with slave-traders, which English merchants may not do.

in a liberal spirit, would almost certainly establish a lucrative trade.

In connection with this subject I may be allowed to call your attention to the rivers Casai and Quango. These are reported by intelligent natives who profess knowledge of the country, and are believed by Portuguese traders, to join somewhere N. of Cassangé, and form the Congo or Zaire of Captain Tuckey. The directions in which I saw those rivers flowing appear to favour the idea. The Casai, according to the report of Matiamvo's people, whom we met, flows E.N.E. even beyond the residence of their chief; and as that is a month or 300 miles from the ford, if it really makes a large bend round to the N.W. after that, we can form an idea of the great importance of the attempts of Lieut. Commander Bedingfield and others to establish commerce on the Congo. It is scarcely possible to estimate the ultimate effect which success in this most laudable effort would produce. These rivers drain such a vast extent of populous slave-producing territory, that they assume features of peculiar interest. The influence of the English squadron on the coast is powerfully felt throughout the country. Of this I have observed ample evidence; and no wonder this is the case, for it makes one proud of his countrymen to witness the zeal and energy with which the officers of our cruisers apply themselves to the suppression of the trade in slaves.

This is accompanied by a map, intended to replace that lost in the 'Forerunner.' I have sent all my observations to Thomas Maclear, Esq., of the Royal Observatory at the Cape, and beg that my positions may be considered *sub judice* till he gives his opinion.

I am, Sir,

Your most obedient servant,

DAVID LIVINGSTON.

3. Edmund Gabriel, Esq., to the Earl of Clarendon.

Loanda, 5th August, 1855.

MY LORD,—I have the honour to report to your Lordship that I have just received a letter from the Rev. Dr. Livingston, communicating to me his progress from the date of his leaving Cassangé and crossing the present boundary of this province, to the 18th May last. He left Cassangé on the 16th February, and after having met with much detention owing to sickness amongst his men, forded the river Quango between the latitudes of $9^{\circ} 45'$ and $9^{\circ} 52'$ S., where it winds between the meridians of $18^{\circ} 25'$ and $18^{\circ} 30'$ of E. long.

Dr. Livingston was desirous of visiting Matiamvo, the paramount

chief of the Lunda country, as well with a view of entering into amicable relations with him, as for the purpose of ascertaining whether the river Casai is navigable in his country, and forms with the Quango the Congo or Zaire of Capt. Tuckey. He therefore kept more to the eastward than he had done in his journey from the Zambesi to this place, and crossing the river Chekapa in lat. $10^{\circ} 10' S.$, and long. $19^{\circ} 42' E.$, and another river, called the Maomba, in lat. $9^{\circ} 38' S.$, and long. $20^{\circ} 13' 30'' E.$, arrived at Cobango, a large trading station on the river Chihombo, situated in lat. $9^{\circ} 31' S.$, and long. $20^{\circ} 31' E.$, from whence Matiamvo's place is E.N.E. about 100 miles.

His companions here expressed a most anxious wish to return home, a feeling in which, looking at them and their circumstances, Dr. Livingston says he could not but sympathise with them, although, still faithful and obedient as they had always been, they were ready to proceed on to the eastward if he had insisted upon it. He however having attained at Cobango the chief object he had in view in desiring to visit Matiamvo, viz. information as to the Casai being navigable in his country, and finding that his funds were so far exhausted, that he had not, to use his own words, "the wherewithal to appear before that potentate," resolved on proceeding southwards to Katema, and thence direct to the Zambesi and Sekeletu's town.

Dr. Livingston having obtained good lunar observations at a spot 2 miles W. of the river Quango, finds that that river is 15 miles farther to the E. than he had placed it on the map which he drew of his journey to this place, he having on that occasion passed it in excessively cloudy weather. He finds also that he was misinformed respecting the course of the Chekapa, which, together with several important geographical points on the route, he has been enabled to establish more accurately from numerous observations taken during his present journey.

His corrections will be forwarded to the Royal Geographical Society by an early opportunity.

In all the letters that I have received from Dr. Livingston during his progress through this province, he speaks in terms of gratitude of the kindness and hospitality which he received at the hands of the several Portuguese authorities through whose jurisdiction he passed.

I am grieved to add that this excellent man's health had suffered a good deal from his having been obliged, after leaving Cassange, to sleep for several nights on a plain, on which the water was flowing ankle deep. He had at length been compelled to form trenches around his berth, and having been detained 25 days in this situation, became much enfeebled by his sufferings

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Explanation of Abbrev.

Sketch of a Route from the
BAROTSI VALLEY, ON THE RIVER LEMBEYE, TO LOANGO,
followed by the
Hon. D. Livingston.

English Miles

0 10 20 30 40 50

English Miles

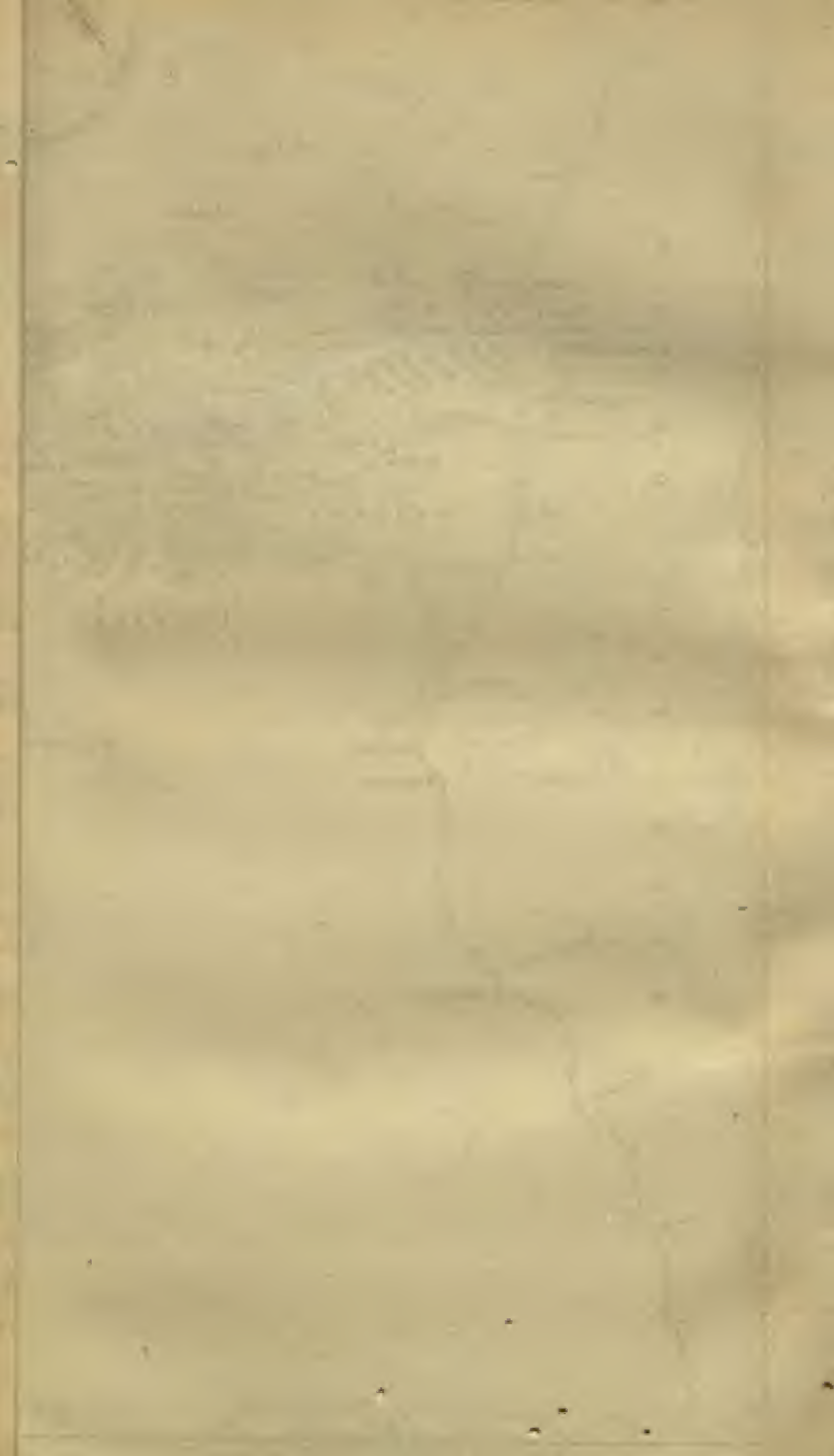
Libelle Country

which is the present chief

Plains of Libelle

several important towns are situated

Libelle



during that time. He nevertheless wrote in cheerful spirits, sanguine of success in "doing his duty" under the guidance and protection of that kind Providence who has already carried him through so many perils and hardships. He assures me that since he knew the value of Christianity, he has ever wished to spend his life in propagating its blessings among men, and adds that the same desire remains still as strong as ever.

I have, &c.

EDMUND GABRIEL.

4. *Edmund Gabriel, Esq., to Consul Brand.*

(Extract.)

Loanda, Aug. 28, 1855.

"I have just received my last letter for the present from him (Dr. Livingston), dated 18th May, lat. $9^{\circ} 31' S.$, long. $20^{\circ} 31' E.$, at a place called Cobango. Having now left the high-road, as it were, and altered course to the southward, he is gone entirely out of my reach. I am grieved beyond measure to find that my last letters, in consequence of some foolish excuses about runaway slaves, did not overtake him. However, as my *very* last letter,—in which I enclosed him the newspaper extracts received with your December letter, one of them announcing the honour so deservedly conferred on him by the University of his native town, Glasgow,—is not yet returned from Cassangé, I still live in hopes that it may have gone after him, and I have offered a reward of twenty milreis to any one who will bring me an acknowledgment of its receipt by Dr. Livingston."

XVII.—*Mission to Central Africa.*

- (1. Extracts from Letters received from ED. VOGEL, Phil. Dr.
2. Geographical Positions of Places between Murzúk and Kuka, and in Mandra, Bornu, and Sudán.
3. Remarks on the Meteorological Observations taken.)

Communicated by the EARL OF CLARENDON.

Read, March 12 and May 14, 1855.

H. U. Addington, Esq., Foreign Office.

Kuka, July 14, 1854.

SIR,—At the end of March I joined an expedition going out under the command of the Sheik Abdelrachmán to Musgo. Up to that time the Sheik had always refused me permission to

leave Kuka for any length of time. The *razzia* went as far as $9^{\circ} 30'$ N. lat., and I had therefore an opportunity of seeing more of the country than any other European before me. I discovered on this occasion a fine large inland lake, with a chain of granitic mountains running from N. to S. along its western bank. I likewise made sure that there does not exist any communication between the river *Shary* and the waters of the Niger system; as the *Shary* runs at $9^{\circ} 30'$, about 20 miles E. of the eastern bank of the lake aforementioned, in the direction from S.E. to N.W. It is joined from the westward by only three very small and, at the time I saw them, nearly dry rivers, coming all from the Felatah mountains; on its right or eastern bank, a very large river, coming from the east, falls into it at about 10° N. lat.*

The *Shary* is a beautiful stream, about 1000 feet broad, and, in the driest season of the year, between 8 and 10 feet deep. During the wet time of the year it must discharge at least 140,000 cubic feet of water every second into the lake Chád.

There was not much fighting all the time we were out, the Musgo people having all fled across the *Shary*; but much useless cruelty towards prisoners, thirty-six of whom were on one occasion cut to pieces alive. Of the 4000 slaves carried off—all women and children under twelve years of age—I regret to state that 3500 died of dysentery and smallpox before the *razzia* reached Kuka. The expedition consisted of about 20,000 horsemen, with 10,000 camp followers, accompanied by about 5000 camels and as many bullocks.

I returned from this expedition, in somewhat indifferent health, about the 10th of June; and I am about to start in two days, by way of Yakóba,† to the river Chadda, to join, if possible, the Niger expedition. You will be aware that neither the important town of Yakóba, nor in fact the whole road from this place to that town, and thence to the river, has ever been visited by Europeans.

The Sultan having given me at last permission to go, with letters of recommendation, I intend to start.

This letter will be accompanied by a parcel of astronomical, magnetical, and meteorological observations made on the road from Murzúk and during my stay here. In a box I have sent some parcels of plants collected here and in Musgo. There are not very many, as, on my arrival here, three months after the rainy season, I found everything dried up; nor will there be any

* Dr. Vogel probably means the Loggeme. The large river to the east is called by Dr. Barth the *Shary*, and the river which Dr. Vogel here calls by that name must be the Loggeme; but the latter, according to Barth's Map, falls into the *Shary*, in Lat. $12^{\circ} 20'$ N., instead of 10° N., as stated by Dr. Vogel.—Ed.

† Since reported to be in Lat. $10^{\circ} 17' 30''$ N., and Long. $9^{\circ} 28'$ E.—Ed.

opportunity for collecting more until a month after the rains have set in, or about the beginning of September. My collection contains nearly everything that was in blossom near Kuka during the months of January and February. I regret that ill health during February and March prevented my collecting any seeds; but I hope to be able to send some of them by the caravan which leaves about the end of this year.

I forward likewise a small collection of geological specimens, which you will perhaps be good enough to send to Sir R. Murchison, at whose request I made it. A small collection of the weapons of this country, which you will likewise find in the box. I beg you to be good enough to forward to the museum of the Sappers and Miners, Woolwich.*

As it is impossible to proceed from this in a S. or S.E. direction, the intervening country being inhabited by the Musgo, with whom the Sheiks of Bornu and Bagermi wage a constant war, I intend to go, at the end of this or beginning of next year, to Wadai, as soon as I have received a sum of about 200*l.*, which I expect by the next caravan from Murzúk. This sum will, should no unforeseen accident occur, cover the expenses of the expedition up to the middle of next year. Wadai has never been explored, and I can go there with perfect safety, as Sheik Abdelrachmán is on the very best terms with his neighbour, and the Sultan of Wadai has, in a very kind letter, written to M. Gagliuffi, the British Vice-Consul at Murzúk, said that it would afford him great pleasure to see me, and that I would be as safe in his country as I could be in Fezzán or Tripoli. From Wadai I hope to be able to proceed some way to the S. or S.E., there being a short and safe road through Darfur and Nubia, by which I can at any time return to Europe. I hope you will approve of this plan, which would make me acquainted with a most interesting part of the interior of Africa.

I received twice during my stay here letters from the English Consul at Tripoli, Colonel Herman; but any letters or despatches he may have sent by the last courier, who left Murzúk about the end of April, are lost, as the bearer was plundered on the road by the Tuaricks. The whole *personnel* of the expedition has enjoyed good health since the last time I had the honour of addressing you; and I embrace this opportunity of acknowledging the great and good services rendered to me and the cause of the mission by Corporal Church and Private Maguire, of the Royal Sappers and Miners, and likewise by Mr. Henry Warrington, who leaves Kuka in a few days for Tripoli.†

* Collected by Corporal Church.—Ed.

† Mr. Warrington died on the return route.—Ed.

G. B. Gaglinffi, Esq., H.B.M. Vice-Consul at Murzúk.

Kuka, Sept. 15, 1854.

SIR,—There is a good opportunity of writing you a few lines by the courier, who is going to announce to Hassan Pashá that our friend Sheik Amúr is again Sultan. I was not here when the revolution, which lasted only a few hours, took place, but returned from Mandra, and was at a village in Ujé, 100 miles S.W. from this, with a friend, Cotsbella Bilal, and had sent for Corporal Church to bring me a little money and a few other things, as I intended to go on to Yakóba. On hearing the news, however, I immediately started off, leaving the luggage under the care of Church, and after a hard ride of two days and a half, arrived here yesterday evening. This morning I went to congratulate the new Sultan, who received me very well.

My attempt to join the Niger-Chadda expedition was unsuccessful. My plan was to go from this to Yakóba, and from thence down the river to the sea shore. As I was about to start, Sheik Abdelrachmán sent for me and told me that I was not to leave Kuka without giving my reason. At last, after much trouble, I got permission to go out of the way of the rains, as my health was very bad; but I was not allowed to go to Yakóba, but ordered to proceed to Mandra, whence I should go to Adamawa and to the Chadda. The Sheik refused any escort, and gave me only a single horseman, but said he had written to the Sultan of Mandra to see me safe to Adamawa. Dr. Barth had not visited Mandra, he having gone by way of Ujé to Adamawa.* After a fortnight's hard travelling over a road which defies any description, the water covering it 2 feet high, and over rivers where I had to stop to build rafts to cross them, I arrived finally at Mora, and was immediately invited by the Sultan to enter the town.

It was only after about a month that I got permission to proceed, but not to Adamawa, as the Mandra people were at war with the Felatahs, and I had therefore to retreat to Ujé, thinking of going from thence either to Yakóba or to Adamawa, when the change of government called me back to Kuka.

Kuka, Oct. 1, 1854.

SIR,—I am anxiously awaiting the arrival of the Murzúk caravan, and intend to start shortly for Fittri, in order to open some communication with the Sultan of Wadai.

* Major Denham, it will be remembered, passed on his route South of Lake Chad, by Mora, as far as the Mindif Mountains.—ED.

Col. G. F. Herman, H.B.M. Consul at Tripoli.

Kuka, Sept. 15, 1854.

SIR,—I intend to stop now two months in Kuka, as the roads are scarcely passable, and flies and mosquitoes are in great quantities. Kuka is not in the region of *tropical rains*; the whole amount of water which has fallen during the 3 months of wet weather, beginning here with June, is only 22·57 English inches; and the quantity of rain in one year will not exceed 25 inches, or about the 10th part of that which falls at the Senegal, and the 5th of that which comes down in the lake district of England. But the tropical rains extend to a distance of only 1 degree S. from this place, where I observed in one night a fall of 8 inches of water. The rain begins in the middle of May, and lasts till the beginning of September. The greatest quantity which has fallen here at one time is 3·25 inches. The great inundation here is caused by the water of the country from the S. all running off towards the lowest points, Lake Chád and the environs of Kuka, which lie in some places even below the level of the lake.

The heat is now moderate, seldom over 95°, and the difference between night and day scarcely perceptible.

Should Sheik Amúr quarrel with the Sultan of Wadai (which event is not impossible), I would make my retreat by way of Nuffi, as I am not inclined to make another journey through the desert, and I am tolerably acclimatized, so that I need not fear the Niger delta.

At present I am busy in collecting plants and making magnetical observations. Plants are here so few that the number of different species will not exceed 250. I never saw so poor a flora, scarcely even in the great desert around Berlin.

Ch. Dickson, Esq., H.B.M. Vice-Consul at Ghadamis.

Zinder, Dec. 7, 1854.

SIR,—Having some business here, and being anxious to determine accurately the geographical positions of this most important place, I have proceeded from Kuka hither with only one servant; but I will in four days return by way of Mimieh; and then with all possible speed, instead of going to Fitri, as I intended to do, I will proceed to Yakóba and Adamawa, with the letters of recommendation Dr. Barth has procured from the Sultan of Sokatú. The Murzúk caravan, which has been detained on account of the dangers of the road, will, I hope, soon arrive.

Geographical Positions of some places on the road between Murzûk and Kuka, determined by Astronomical Observations, after a rough reduction.

Place.	Elevation.	North Latitude.			Longitude E. from Greenwich.	Remarks.
		°	'	"		
Murzûk . . .	Eng. feet. 1500	25	55	16	0 56 40	Town.—Variat. 13° 5' 43" W. Inclin. 38° 35' 12".
Hash Hashâ . .	1300	..	..	..	..	Village.
Mafra . . .	1200	25	51	33	0 59 30	Village.
Mustata . . .	1370	25	30	6	0 59 10	Oasis.
Gatrone . . .	1440	24	53	25	1 0 42	Town.—Variat. 13° 12' 36" W.
Kassarna . . .	1380	..	..	..	..	Well.
Tejeri . . .	1520	24	19	13	0 59 29	Town.—Variat. 13° 8' 54" W.
Mushera . . .	1450	..	..	..	..	Well; hills 1600.
El Wahr . . .	2020	..	..	..	..	Well; hills 2400.
L'Achmar . . .	1750	21	59	58	0 56 6	Well; hill west 2100.
Mafra . . .	1420	21	12	11	0 55 28	Oasis.
Scheit . . .	1300	20	31	28	0 54 55	Oasis; hill 1600.
Ikha . . .	1215	..	..	..	..	Oasis; hills 1500.
Anaf . . .	1140	..	..	..	..	Village; hills 1300.
Ashenuma . . .	1100	19	8	53	0 53 20	Village; hills 1400.
Shimotiru . . .	1390	18	56	46	0 53 19	Village; hills 1700.—Variat. 13° 48' 30" W. Inclin. 36° 7' 54".
Bilma . . .	1000	16	41	55	0 53 35	Town; hills 1200.
Zausheir . . .	1100	..	..	..	..	Oasis.
Zau Kebir . . .	1170	15° 13'	30"	0 52 37	0 52 37	Oasis; hills 1400.
Agadem . . .	1000	16	52	6	0 53 6	Oasis; hills 1200.—Variat. 13° 48' 20" W.
Belgagferri . .	920	15	44	26	0 52 40	Well; hills 1000.
Lake Chad . .	840	14	27	0	0 53 0	North-west end.
Bura . . .	850	13	51	5	0 52 57	Town.
Yean . . .	890	13	33	18	0 53 36	Town.
Kuka . . .	880	12	15	14	0 53 36	Town.—Variat. 14° 5' 12" W. Inclin. 13° 8' 51".

E. VOGEL.

Note.—Dr. Vogel's observations for longitude were made with a 16" sextant and one good chronometer.

The following table shows at what stations lunar distances were taken, and the number of them; the longitudes of the other stations depend upon chronometrical determinations alone.

The observations for these last are very numerous, and consist of corresponding altitudes E. and W. of the sun or stars.

Seta of Lunar Distances of 10 or 11 Observations in each Set.

• or ☉ East • or ☉ West
of Moon. of Noon.

MURZÛK (observations not received).

Gatrone . . .	1	
Tejeri . . .	1	1
Achmar . . .	1	1
Ashenuma . .	1	
Bilma . . .	..	1
Zau Kebir* . .	1	1
Agadem . . .	1	1
Bura . . .	1	
Yean . . .	..	1
KUKA . . .	6	5

* Here Dr. Vogel remarks that his "chronometer must have stopped 15 or 16 minutes."—F. G.

H. U. Addington, Esq., Foreign Office.

Kuka, Jan. 12, 1855.

Sir,—I have the honour to enclose a few geographical positions determined by astronomical observations in Mandra, Bornu, and Sudán, the latter of which will, in the hands of so experienced a traveller and accurate observer as Dr. Barth, go far in determining the positions of Kano, Sokatú, Timbuktu, and other places which he has visited. I have now finished a twelvemonth of meteorological and many magnetical observations, which I will forward to you as soon as they are properly arranged. Very interesting is the small amount of rain observed by me here. During the rainy season (beginning of July to end of September) only 19·5 English inches fell, and during the whole year not more than 21 inches.

Geographical Positions in Mandra, Bornu, and Sudán, determined by
Astronomical Observations.

	North Latitude.			East from Greenwich.		
	°	'	"	°	'	"
Mandra, Mora (Capital)	10	58	38	13	22	0
1430' (Mountains 2400-2700') above the sea.						
Ujé (Capital of)	12	9	0	12	45	56
1200' above the sea.						
Máchna (Sudán)	13	8	15	10	7	15
1400' (Mountains 1440') above the sea.						
Mínjé (Sudán)	13	29	50	10	3	50
1300' (Mountains 1450') above the sea.						
Zinder (Sudán)	13	47	15	9	2	45
1700' above the sea.						

Kuka, January, 1855.

R. VOGEL.

[The observations from which the above were calculated by Dr. Vogel have not yet been received.—Feb. 1, 1856.—Ed.]

Meteorological Observations made on the road between Murzúk and Kuka.

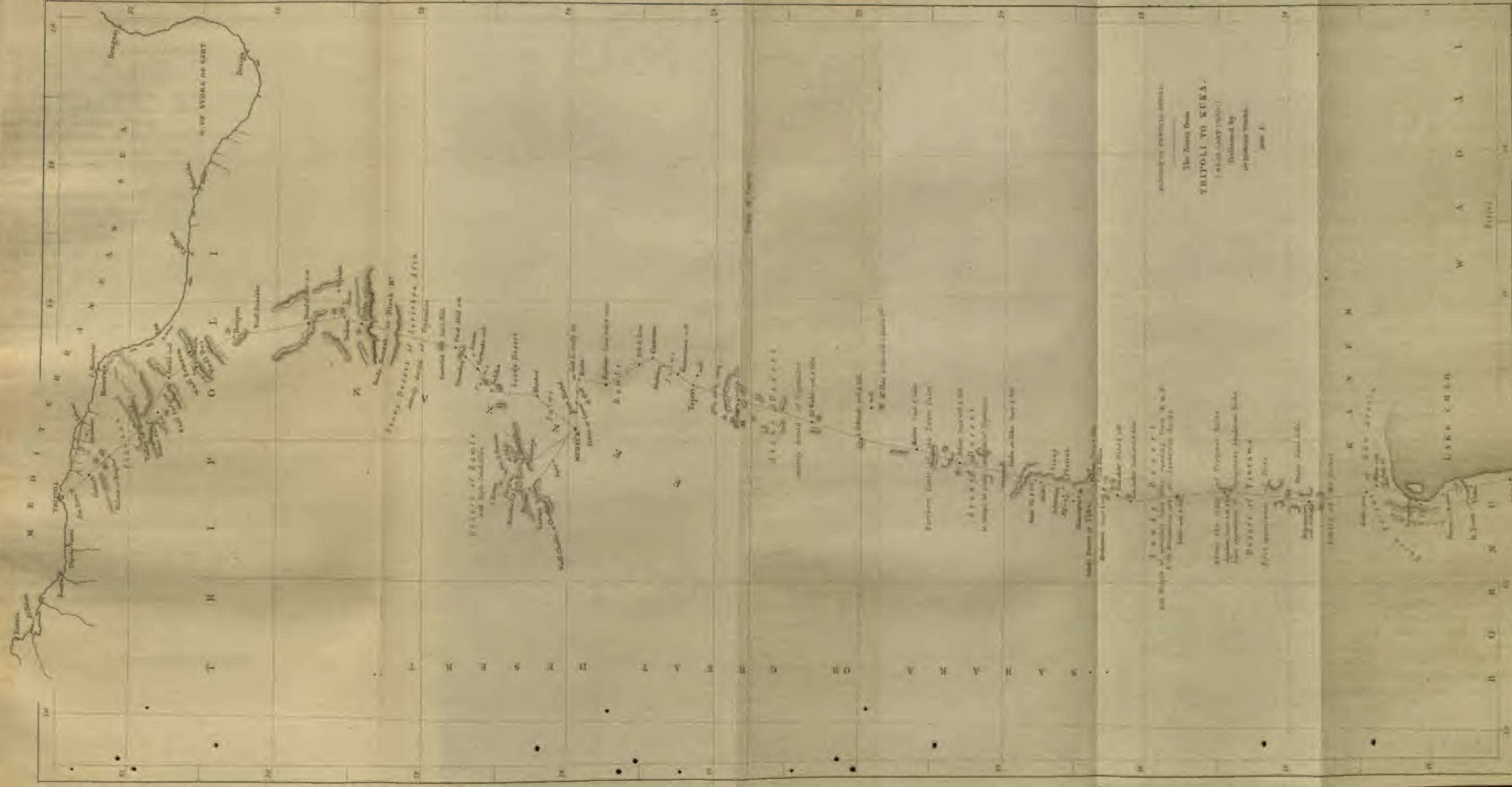
The lowest temperature was observed on December 14 in a sandy desert near the 18th degree of N. lat., where, at 6 h. 15 m. A.M., the thermometer showed $39^{\circ} 7'$; on the same day at 5 h. 30 m. P.M. it stood at 70° . The greatest difference of temperature on one and the same day I observed on the 19th of December at Agadem, where, in 5 h. 30 m., the thermometer rose 43° —the temperature being, at 7 h. 30 m. A.M., $58^{\circ} 5'$; at 1 h. P.M., $101^{\circ} 5'$. On the 15th December, in the desert near Dibla, I had observed the thermometer rising $41^{\circ} 3'$ in 6 h. 40 m.—i.e., from $42^{\circ} 7'$ at 6 h. 20 m. to 84° at 1 h. P.M.

The weather was always dry and clear with the exception of the 24th and 25th October at Gatrone, where, during a violent gale from S.E., black clouds covered the sky, and a little rain fell at 11 h. A.M. on the 25th. Violent rain I experienced at Madrua at 2 h. P.M. on November 1, and during the following night.

Near and at Tibu the sky is always overcast with a thick haze in consequence of the fine sand dust which is raised by the E.N.E. wind, blowing in this country every day from sunrise until 1 h. P.M. with great violence.

Meteorological observations made at Kuka in Bornu from the 19th of January to the 30th of June, 1854.

These observations were made, under my direction, by Corporal Church, of the Royal Sappers and Miners, who read off the instruments every day at 8 o'clock A.M., at noon, and at 3 and 6 o'clock P.M. In the MS. journal will be found, in the first column, the *dates*; in the second, the *readings* of Barrow's barometer, with the thermometer attached to it in the third; in the fourth column those of a glass tube, divided into 0.05 of an inch, and filled here with mercury. There is to be added the correction for depression, amounting in the unboiled tube to 0.04. In the next column, under "T," is written the temperature of air observed on a thermometer hanging free in the shade; and in the next two columns the *readings* of the hygrometer—i.e., of two thermometers, one with a dry and one with a wet bulb. Under the head of Th. ☉, are two columns, inscribed "5 m." and "10 m." There are observations of a thermometer with a black bulb exposed 5 minutes or 10 minutes to the rays of the sun: these are only few, owing to the cloudy and hazy weather predominant here. Then follow observations made on thermometers which were kept completely dry in well-covered holes, 2 inches in diameter, 1, 3, and 5 feet under the surface of the earth. The readings of these instruments, as well as of that with the black bulb, can be compared immediately with the observed temperature of air; all the thermometers having been corrected for their respective errors. Then comes the direction and strength of wind, the strength being indicated by numbers, from a gentle breeze (1) to a gale (4). In the last small column will be found the state of the sky; "C" indicating clear weather, "H" haze, with one, two, or three dashes according to the density of it—"H" being a light white hue in the blue sky, and "H^o" a covering so thick that the disc of the sun can just be seen. This haze is occasioned by the exceedingly fine dust of the clayey soil, the particles of which remain suspended





in the air a long time after all wind has ceased. The numbers in the column show the quantity of clouds, and mean (1.) that about $\frac{1}{2}$; (2.) that $\frac{1}{3}$; (3.) that $\frac{1}{4}$; and (4.); that the whole of the sky is overcast. Whenever the instruments were read at more than 15 m. beyond the time above mentioned, it will be found remarked in the last column.

The temperature of the water of a well 48 feet deep and only 18 inches in diameter was, from January up to the end of June, very constant— $88^{\circ} 3'$; never varying more than $5'$ from this average.

The temperature of boiling water I determined on March 23 at 23 h. 0 m. (using, instead of distilled water, boiled well water); and found, as mean of 50 readings, $210^{\circ} 378$; temperature of air 100.8 , barom. 29.16 .

Water of the Lake Chád, boiled on March 23 at 23 h. 50 m., by $210^{\circ} 491$ (mean of 60 readings), air 102.1 , barom. 29.16 .

March 24, at 5 o'clock, well water boiled at $210^{\circ} 247$ (mean of 50 readings), air 100.3 , barom. 29.08 . As the mean height of barometer here is about 29.20 (at 80°), I have reduced the above-mentioned observations to this standard, and they give, corrected likewise for temperature of air:—

				h.	m.	
Well-water, March 23	..	..	..	23	0	910 Elev. of Kuka.
Lake-water, " 23	..	..	..	23	50	839 "
Well-water, " 24	..	..	..	5	0	900 "
Mean, Kuka above the Sea..						883 feet.

Kuka is situated at $12^{\circ} 15' 14''$ N. lat., and $13^{\circ} 24'$ E. of Greenwich.

H. U. Addington, Esq., Foreign Office.

Kuka, Jan. 19, 1855.

SIR,—I have the honour to communicate to you that I leave Kuka to-morrow to proceed, by way of Yakóba, to Adamawa, following up the discoveries of Dr. Barth—a journey which will be now comparatively safe and easy, in consequence of the friendly relations he has established with the Sultan Alió, and furnished as I am with letters from Sokatú.

ED. VOGEL, Ph. Dr.

XVIII.—*Arctic Exploration, with Information respecting Sir John Franklin's missing Party.* By Dr. JOHN RAE, F.R.G.S. (*Gold Medallist.*)

Communicated by the HUDSON BAY COMPANY.

Read, November 13, 1854.

York Factory, Hudson's Bay, September 1st, 1854.

SIR,—I have the honour to report for the information of the Governor, Deputy-Governor, and Committee, that I arrived here yesterday with my party all in good health, but, from causes which will be explained in their proper place, without having effected the object of the Expedition.* At the same time information has been obtained and articles purchased from the natives, which prove beyond a doubt that a portion, if not all, of the then survivors of the long-lost and unfortunate party under Sir John Franklin had met with a fate as melancholy and dreadful as it is possible to imagine.

By a letter, dated Chesterfield Inlet, 9th August, 1853, you are in possession of my proceedings up to that time. Late on the evening of that day we parted company with our small consort, she steering down to the southward, whilst we took the opposite direction towards Repulse Bay.

Light and variable winds daily retarded our advance northward; but by anchoring during the flood, and sailing or rowing with the ebb tide, we gained some ground daily. On the 11th we met with upwards of three hundred walrus lying on a rock a few miles off shore. They were not at all shy, and several were mortally wounded, but one only (an immensely large fellow) was shot dead by myself. The greater part of the fat was cut off and taken on board, which supplied us abundantly with oil for our lamps all winter.

On the forenoon of the 14th, having a fair wind, we rounded Cape Hope and ran up Repulse Bay; but as the weather was very foggy, completely hiding every object at the distance of $\frac{1}{4}$ of a mile, we made the land about 7 miles east of my old winter quarters. Next day, midst heavy rain, we ran down to North Pole River, moored the boat, and pitched the tents.

The weather being still dark and gloomy, the surrounding country presented a most dreary aspect. Thick masses of ice clung to the shore, whilst immense drifts of snow filled each ravine, and lined every steep bank that had a southerly exposure. No Esquimaux were to be seen, nor any recent traces of them. Appearances could not be less promising for wintering safely, yet I determined to remain until the 1st September, by which date some opinion could be formed as to the practicability of procuring sufficient food and fuel for our support during the winter, all the provisions on board at this time being equal to only three months' consumption.

The weather fortunately improved, and not a moment was lost. Nets were set, hunters were sent out to procure venison, and the majority of the party was constantly employed collecting fuel. By the end of August a supply of the latter essential article (*Andromeda tetragona*) for fourteen weeks was laid up; thirteen deer and one musk bull had been shot, and one hundred and thirty-six salmon caught. Some of the favourite haunts of the Esquimaux had been visited, but no indications were seen to lead us to suppose that they had been lately in the neighbourhood.

The absence of the natives caused me some anxiety, not that I expected any aid from them, but because I could attribute their having abandoned so favourite a locality to no other cause than a scarcity of food, arising from the deer having taken another route in their migrations to and from the north.

On the 1st of September I explained our position to the men, the quantity

* Which was to complete the Survey of the W. Coast of Boothia.—J. R.

of provisions we had, and the prospects, which were far from flattering, of getting more.

They all most readily volunteered to remain, and our preparations for a nine months' winter were continued with unabated energy. The weather, generally speaking, was favourable, and our exertions were so successful that by the end of the month we had a quantity of provisions and fuel collected adequate to our wants up to the period of the spring migrations of the deer.

One hundred and nine deer, one musk ox (including those killed in August), fifty-three brace of ptarmigan, and one seal had been shot, and the nets produced fifty-four salmon. Of larger animals above enumerated, forty-nine deer and the musk ox were shot by myself, twenty-one deer by Mistegan, the deer-hunter, fourteen by another of the men, nine by William Ouligbuck, and sixteen by the remaining four men.

The cold weather set in very early and with great severity. On the 20th all the smaller and some of the larger lakes were covered with ice 4 to 6 inches thick. This was far from advantageous for deer-shooting, as these animals were enabled to cross the country in all directions, instead of following their accustomed passes.

October was very stormy and cold. About the 15th the migrations of the deer terminated, and twenty-five more were added to our stock. Forty-two salmon and twenty trout were caught, with nets and hooks set in lakes under the ice. On the 28th the snow was packed hard enough for building, and we were glad to exchange the cold and dismal tents (in which the temperature had latterly been 36° or 37° below the freezing point) for the more comfortable shelter of snow houses, which were built on the S.E.S. side of Beacon Hill, by which they were all protected from the prevailing N.W. gales. The houses were nearly half a mile south of my winter quarters of 1846-7.

The weather in November was comparatively fine, but cold, the highest, lowest, and mean temperature, uncorrected for error of thermometer, being respectively 38° and 18° below zero. Some deer were occasionally seen, but only four were shot; some wolves, several foxes, and one wolverine, were killed, and from the nets fifty-nine salmon and twenty-two trout were obtained.

Our most productive fishery was in a lake about 3 miles distant, bearing E. (magnetic) from Beacon Hill, or the mouth of North Pole River.

The whole of December, a very few days excepted, was one continual gale, with snow and drift. When practicable, the men were occupied scraping under snow for fuel, by which means our stock of that very essential article was kept up. The mean temperature of this month was 23° below zero. The produce of our nets and guns was extremely small, amounting to one partridge, one wolf, and twenty-seven fish.

1854. On the 1st of January the temperature rose to the very unusual height of 16° above zero, the wind at the time being S.E., with snow. Our nets, after being set in different lakes without success, were finally taken up on the 12th, only five fish having been caught. The thermometer was tested by freezing mercury, and found to be in error, the temperature indicated by it being $4^{\circ}5$ too high.

The cold during February was steady and severe, but there were fewer storms than usual. Deer were more numerous, and generally travelling northward; one or two were wounded, but none killed. On two occasions (1st and 27th) that beautiful but rare appearance of the clouds near the sun, with three fringes of pink and green following the outline of the cloud, was seen; and I may add that the same splendid phenomenon was frequently observed during the spring, and was generally followed by a day or two of fine weather.

During the latter part of the month preparations were being made for our spring journeys. A carpenter's workshop was built of snow, and our sledges

were taken to pieces, reduced to as light a weight as possible, and then reunited more securely than before. The mean temperature of February, corrected for error of thermometer, was 39° below zero, the highest and lowest being 20° and 53° .

On the 1st of March a female deer, in fine condition, was shot, and on the 9th and 10th two more were killed. Three men were absent some days during this month in search of Esquimaux, from whom we wished to obtain dogs. They went as far as the head of Ross Bay, but found no traces of these people.

On the 14th I started, with three men hauling sledges, with provisions to be placed in "cache" for the long spring journey. Owing to the stormy state of the weather we got no farther than Cape Lady Pelly, on the most northerly point of which our stores were placed, under a heap of large stones, secure from any animal, except man or the bear. We returned on the 24th, the distance walked altogether being 170 miles.

On the 31st March, leaving three men in charge of the boat and stores, I set out with the other four, including the interpreter, with the view of tracing the W. coast of Boothia from the Castor and Pollux River to Bellot Strait. The weight of our provisions, &c., with those deposited on the way, amounted to 865 lbs.—an ample supply for sixty-five days.

The route followed for part of the journey being exactly the same as that of spring, 1847, it is unnecessary to describe it. During the two first days, although we did not travel more than 15 miles per day, the men found the work extremely hard; and, as I perceived that one of them (a fine active young fellow, but a light weight) would be unable to keep pace with the others, he was sent back, and replaced by Mistegan, a very able man, and an experienced sledge-hauler. More than a day was lost in making this exchange, but there was still abundance of time to complete our work, if not opposed by more than common obstacles.

On the 6th April we arrived at our provision "cache," and found it all safe. Having placed the additional stores on the sledges, which made those of the men weigh more than 160 lbs. each, and my own about 110 lbs., we travelled 7 miles farther, then built a snow-house on the ice 2 miles from shore. We had passed among much rough ice; but hitherto the drift banks of snow, by lying in the same direction in which we were travelling, made the walking tolerably good. As we advanced to the northward, however, these crossed our track (showing that the prevailing winter gales had been from the westward), and, together with stormy weather, impeded us so much that we did not reach Colville Bay until the 16th. The position of our snow house was in lat. $68^{\circ} 13' 5''$ N., long. by chronometer $88^{\circ} 25' 51''$ W., the variation of the compass being $86^{\circ} 20'$ W. From this place it was my intention to strike across land as straight as possible for the Castor and Pollux River.

The 11th was so stormy that we could not move; and the next day, after placing "en cache" two days' provisions, we had walked only 6 miles in a westerly direction, when a gale of wind compelled us to get under shelter. The weather improved in the evening, and, having the benefit of full moon, we started again at a few minutes to 8 P.M. Our course at first was the same as it had been in the morning, but the snow soon became so soft and deep that I turned more to the northward in search of firmer footing. The walking was excessively fatiguing, and would have been so even to persons travelling unencumbered, as we sank at every step knee-deep in snow. Eight and a half miles we accomplished in 6½ hours, at the end of which, as we required some rest, a small snow house was built, and we had some tea and frozen pemican.

After resting 3 hours we resumed our march, and, by making long détours, found the snow occasionally hard enough to support our weight. At 30 minutes to noon on the 13th our day's journey terminated, in lat. $68^{\circ} 23' 30''$

N., long. $89^{\circ} 14' 53''$ W., variation of compass $83^{\circ} 31'$ W. At $1\frac{1}{2}$ mile from our bivouac we had crossed the arm of a lake of considerable extent; but the country around was so flat, and so completely covered with snow, that its limits could not be easily defined, and our snow hut was on the borders of another lake, apparently somewhat smaller.

A snow-storm of great violence raged during the whole of the 14th, which did not prevent us from making an attempt to get forward; after persevering $2\frac{1}{2}$ hours, and gaining $1\frac{1}{2}$ mile distance, we were again forced to take shelter.

The 15th was very beautiful, with a temperature of only 8° below zero. The heavy fall of snow had made the walking and sledge-hauling worse than before. It was impossible to keep a straight course, and we had to turn much out of our way, so as to select the hardest drift-banks. After advancing several miles, we fortunately reached a large lake, containing a number of islands, on one of which I noticed an old Esquimaux tent site. The fresh foot-marks of a partridge (*tetrax rufescens*) were also seen, being the only signs of living thing (a few tracks of foxes excepted) that we observed since commencing the traverse of this dreary waste of snow-clad country. To the lake above mentioned, and to those seen previously, the name of Barrow was given, as a mark of respect to John Barrow, Esq., of the Admiralty, whose zeal in promoting, and liberality in supporting, many of the expeditions to the Arctic Sea are too well known to require any comment further than that he presented a very valuable Halkett's boat for the service of the party (named by him the James Fitz-James), which unfortunately, by some irregularity in the railway baggage-trains between London and Liverpool, did not reach the latter place in time for the steamer, although sent from London some days before. Our snow-hut was built on the edge of a small lake in lat. $68^{\circ} 31' 38''$ N., long. $89^{\circ} 22' 55''$ W., variation of compass $82^{\circ} 30'$ W.

The difficulties of walking were somewhat diminished on the 16th by a fresh breeze of wind, which drifted the snow off the higher ground, and we were enabled to make a fair day's journey. Early on the 17th we reached the shore of Pelly Bay, but had barely got a view of its rugged ice covering before a dense fog came on, and we had to steer by compass for a large rocky island some miles to the westward, and stopped on an islet near its E. shore until the fog cleared away. This luckily happened some time before noon, and afforded an opportunity of obtaining observations, the results of which were—lat. $68^{\circ} 44' 53''$ N., long. by chronometer $89^{\circ} 45' 47''$, and variation $84^{\circ} 20'$ W. Even on the ice we found the snow soft and deep—a most unusual circumstance. The many detentions I had met with caused me now, instead of making for the Castor and Pollux River, to attempt a direct course towards the Magnetic Pole, should the land W. of this be smooth enough for travelling over. The large island W. of us was so rugged and steep that there was no crossing it with sledges; we therefore travelled along its shore to the northward, and stopped for the night within a few miles of its northern extremity. The track of an Esquimaux sledge, drawn by dogs, was observed to-day, but it was of old date.

The morning of the 18th was very foggy; but after rounding the N. point of the island, it became clear, and we travelled due W., or very nearly so, until within 3 miles of the W. shore of the bay, which presented an appearance so rocky and mountainous that it was evident we could not traverse it without much loss of time. As the country towards the head of the bay looked more level, I turned to the southward, and after a most circuitous walk of more than 16 miles, we built our snow house on the ice 5 miles from shore. Many old traces of Esquimaux were seen on the ice to-day.

On the 19th we continued travelling southward, and our day's journey, about equal to that of yesterday, terminated near the head of the bay.

20th April. The fresh foot-marks of an Esquimaux, with a sledge, having

been seen yesterday on the ice, within a short distance of our resting-place, the interpreter and one man were sent to look for them, the other two being employed in hunting and collecting fuel, whilst I obtained excellent observations, the results of which were—lat. $68^{\circ} 29' 28''$ N.; long., by chronometer, $90^{\circ} 29' 32''$ W.; variation of compass, $98^{\circ} 30'$ W. The latter is apparently erroneous, probably caused by much local attraction.

After an absence of eleven hours, the men sent in search of Esquimaux returned in company with seventeen natives (five of whom were women), and several of them had been at Repulse Bay when I was there in 1847; most of the others had never before seen "whites," and were extremely forward and troublesome. They would give us no information on which any reliance could be placed, and none of them would consent to accompany us for a day or two, although I promised to reward them liberally. Apparently there was a great objection to our travelling across the country in a westerly direction. Finding it was their object to puzzle the interpreter and mislead us, I declined purchasing more than a piece of seal from them, and sent them away, not, however, without some difficulty, as they lingered about with the hope of stealing something; and, notwithstanding our vigilance, succeeded in abstracting from one of the sledges a few pounds of biscuit and grease.

The morning of the 21st was extremely fine, and at 3 A.M. we started across land towards a very conspicuous hill bearing west of us. On a rocky eminence some miles inland, we hid a "cache" of the seal's flesh we had purchased. Whilst doing this our interpreter made an attempt to join his countrymen; fortunately his absence was observed before he had gone back very far, and he was overtaken after a sharp race of 4 or 5 miles. He was in a great fright when we came up to him, and was crying like a child, but expressed his readiness to return, and pleaded sickness as an excuse for his conduct. I believe he was really unwell, probably from having eaten too much boiled seal's flesh, with which he had been regaled at the snow huts of the natives.

Having taken some of the lading off Ouligbuck's sledge, we had barely resumed our journey when we were met by a very intelligent Esquimaux driving a dog's sledge laden with musk-ox beef. This man at once consented to accompany us two days' journey, and in a few minutes had deposited his load on the snow, and was ready to join us. Having explained my object to him, he said that the road by which he had come was the best for us, and having lightened the men's sledges, we travelled with more facility. We were now joined by another of the natives, who had been absent seal-hunting yesterday, but being anxious to see us, had visited our snow-house early this morning, and then followed up our track. This man was very communicative, and on putting to him the usual questions as to his having seen "white men" before, or any ships or boats, he replied in the negative, but said that a party of "Kabloonans" had died of starvation a long distance to the west of where we then were, and beyond a large river. He stated that he did not know the exact place, that he never had been there, and that he could not accompany us so far.

The substance of the information then and subsequently obtained from various sources was to the following effect:—

In the spring, four winters past (1850), whilst some Esquimaux families were killing seals near the north shore of a large island, named in Arrow-smith's charts King William Land, forty white men were seen travelling in company southward over the ice, and dragging a boat and sledges with them. They were passing along the west shore of the above-named island. None of the party could speak the Esquimaux language so well as to be understood, but by signs the natives were led to believe the ship or ships had been crushed by ice, and that they were then going to where they

expected to find deer to shoot. From the appearance of the men (all of whom, with the exception of one officer, were hauling on the drag-ropes of the sledge, and were looking thin) they were then supposed to be getting short of provisions, and they purchased a small seal, or piece of seal, from the natives. The officer was described as being a tall, stout, middle-aged man. When their day's journey terminated they pitched tents to rest in.

At a later date the same season, but previous to the disruption of the ice, the corpses of some thirty persons and some graves were discovered on the continent, and five dead bodies on an island near it, about a long day's journey to the north-west of the mouth of a large stream, which can be no other than Back's Great Fish River (named by the Esquimaux Oot-koo-li-ca-lik), as its description and that of the low shore in the neighbourhood of Point Ogle and Montreal Island agree exactly with that of Sir George Back. Some of the bodies were in a tent or tents, others were under the boat, which had been turned over to form a shelter, and some lay scattered about in different directions. Of those seen on the island it was supposed that one was that of an officer (chief), as he had a telescope strapped over his shoulders, and his double-barrelled gun lay underneath him. From the mutilated state of many of the bodies, and the contents of the kettles, it is evident that our wretched countrymen had been driven to the last dread alternative as a means of sustaining life. A few of the unfortunate men must have survived until the arrival of the wild fowl (say until the end of May), as shots were heard and fresh bones and feathers of geese were noticed near the scene of the sad event.

There appears to have been an abundant store of ammunition, as the gunpowder was emptied by the natives in a heap on the ground out of the kegs or cases containing it, and a quantity of shot and ball was found below high-water mark, having probably been left on the ice close to the beach before the spring thaw commenced. There must have been a number of telescopes, guns (several of them double-barrelled), watches, compasses, &c., all of which seem to have been broken up, as I saw pieces of these different articles with the natives; and I purchased as many as possible, together with some silver spoons and forks, an order of merit in the form of a star, and a small silver plate engraved "Sir John Franklin, R.C.N."

Enclosed is a list of the principal articles bought, with a note of the initials, and a rough pen-and-ink sketch of the crests on the forks and spoons. The articles themselves I shall have the honour of handing over to you on my arrival in London.

None of the Esquimaux with whom I had communication saw the "white men" either when living or after death, nor had they ever been at the place where the corpses were found, but had their information from natives who had been there, and who had seen the party when travelling over the ice. From what I could learn, there is no reason to suspect that any violence had been offered to the sufferers by the natives.

As the dogs in the sledge were fatigued before they joined us, our day's journey was a short one. Our snow-house was built in lat. $68^{\circ} 29' N.$, and long. $90^{\circ} 53' 42'' W.$, on the bed of the river, having high mud banks, and which falls into the west side of Pelly Bay, about lat. $68^{\circ} 47' N.$, and long. $90^{\circ} 36' W.$

On the 22nd we travelled along the north bank of the river (which I named after Captain Becher of the Admiralty) in a westerly direction for 7 or 8 miles, until abreast of a lofty and peculiarly-shaped hill, already alluded to, and which I named Ellice Mountain, when we turned more to the northward. We soon arrived at a long, narrow lake, on which we encamped, a few miles from its east end, our day's march being little more than 13 miles. Our Esquimaux auxiliaries were now anxious to return, being in dread, or pro-

fessing to be so, that the wolves or wolverines would find their "cache" of meat and destroy it. Having paid them liberally for their aid and information, and having bade them a most friendly farewell, they set out for home as we were preparing for bed.

Next morning provisions for six days were secured under a heap of ponderous stones, and we resumed our march along the lake. Thick weather, snow-storms, and heavy walking, sadly retarded our advance. The Esquimaux had recommended me, after reaching the end of the chain of lakes (which ran in a north-westerly direction for nearly 20 miles, and then turned sharply to the southward), to follow the windings of a brook that flowed from them. This I attempted to do, until finding that we would be led thereby far to the south, we struck across land to the west, among a series of hills and valleys. Tracks of deer now became numerous, and a few traces of musk cattle were observed.

At 2 A.M., on the 26th, we fell upon a river, with banks of mud and gravel 20 to 40 feet high, and about $\frac{1}{4}$ mile in width. After a most laborious walk of more than 18 miles we found an old snow-hut, which, after a few repairs, was made habitable, and we were snugly housed at 6 h. 40 m. A.M. Our position was in lat. $68^{\circ} 25' 27''$ N., long. $93^{\circ} 4' 14''$ W.

One of my men, who, from carelessness some weeks before, had severely frozen two of his toes, was now scarcely able to walk; and as, by Esquimaux report, we could not be very far from the sea, I prepared to start in the evening, with two men and four days' provisions, for the Castor and Pollux River, leaving the lame man and another to follow at their leisure a few miles on our track to some rock that lay in our route, where they were more likely to find both fuel and game than on the bare, flat ground where we then were.

The evening of the 26th was very fine as we commenced tracing the course of the river seaward, sometimes following its course, at others travelling on its left or right bank to cut off points. At 4 A.M., on the 27th, we reached the mouth of the river, which, by subsequent observation, I found to be situate in lat. $68^{\circ} 32'$ N., and long. $93^{\circ} 32'$ W. It was rather difficult to discover when we had reached the sea, until a mass of rough ice settled the question beyond a doubt. After leaving the river we walked rapidly due west for 6 miles, then built our usual snug habitation on the ice 3 miles from shore, and had some partridges (*tetrax mutus*) for supper at the unseasonable hour of 8 A.M. We had seen great numbers of these birds during the night. Our lat. was $68^{\circ} 32' 1''$ N., long. $93^{\circ} 44' 48''$ W., being $3' 38''$ N., and about $13'$ E. of Simpson's position of the mouth of the Castor and Pollux River.

The weather was overcast with snow when we resumed our journey at 8 h. 30 m. P.M. On the 27th we directed our course directly for the shore, which we reached after a sharp walk of $1\frac{1}{2}$ h., in doing which we crossed a long stony island of some miles in extent. As by this time it was snowing heavily, I made my men travel on the ice, the walking being better there, whilst I followed the windings of the shore, closely examining every object along the beach.

After passing several heaps of stones which had evidently formed Esquimaux caches, I came to a collection larger than any I had yet seen, and clearly not intended for the protection of property of any kind. The stones, generally speaking, were small, and had been built in the form of a pillar, but the top had fallen down, as the Esquimaux had previously given me to understand was the case.

Calling my men to land, I sent one to trace what looked like a bed of a small river immediately W. of us, whilst I and the other man cleared away the pile of stones in search of a document. Although no document was found, there could be no doubt in my own mind, and in that of my companion, that its

construction was not that of the natives. My belief that we had arrived at the Castor and Pollux River was confirmed, when the person who had been sent to trace the apparent stream bed, returned with the information that it was clearly a river.

My latitude of the Castor and Pollux is $68^{\circ} 28' 37''$ N., agreeing within $\frac{1}{2}$ mile with that of Simpson, but our longitudes differ considerably, his being $94^{\circ} 14'$ W., whilst mine was $93^{\circ} 58'$ W. My longitude is nearly intermediate between that of Simpson and Sir George Back, supposing the latter to have carried on his survey eastward from Montreal Island.*

Having spent upwards of an hour in fruitless search for a memorandum of some kind, we began to retrace our steps, and after a most fatiguing march of fifteen hours, during which we walked at least 30 miles, we arrived at the snow-hut of the men left behind. They had shot nothing, and had not collected sufficient andromeda for cooking, but had been compelled to use some grease. The frost-bitten man could scarcely move.

Early on the morning of the 29th, during a heavy fall of snow, we set out for the mouth of the river, which was named in honour of Sir Roderick Murchison, the late President of the Royal Geographical Society, and, after losing our way occasionally in attempting to make short cuts, we arrived at Cache Island (so named from an Esquimaux cache that was on it), within 2 miles of the sea, at 8 A.M., and stopped there, as it blew a gale with drift.

As soon as we got under shelter and had supped, preparations were made for starting in the evening for Bellot Strait. An ample stock of provisions and fuel for twenty-two days were placed on two of our best sledges, and I hauled on my own small sledge my instruments, books, bedding, &c., as usual.

On the evening of the 29th the weather was so stormy that, although we were prepared to start at 8 o'clock, we could not get away until past 2 on the following morning, when, after travelling little more than 5 miles, a heavy fall of snow and strong wind caused us again to take shelter.

Our advance was so much impeded by thick weather and soft snow that we did not arrive within a few miles of Cape Porter of Sir John Ross until the 6th of May. In doing this we had traversed a bay, the head of which was afterwards found to extend as far N. as lat. $68^{\circ} 54'$ N. Point Sir H. Dryden, its western boundary, is in lat. $68^{\circ} 44'$ N., long. $94^{\circ} 11'$ W. To this bay the name of Shepherd was given, in honour of the Deputy-Governor of the Honourable Hudson's Bay Company, and an island near its head was called Bence Jones, after the distinguished medical man and analytical chemist of that name, to whose kindness I and my party were much indebted for having proposed the use of, and prepared, some extract of tea for the expedition. This article we found extremely portable, and as the tea could be made without boiling water, we often enjoyed a cup of that refreshing beverage, when otherwise from want of fuel we must have been satisfied with cold water.

From Point Dryden the coast, which is low and stony, runs in a succession of small points and bays about 10 miles nearly due W., then turns sharply up to the N. in lat. $68^{\circ} 45'$ N., long. $94^{\circ} 38' 50''$ W., which was ascertained by observations obtained on an island near the shore. The point was called Cape Colville, after the governor of the Company, and the island, Stanley. To the W., at the distance of 7 or 8 miles, land was seen, which received the appellation of Matheson Island, as a mark of respect to one of the directors of the Company.

Our snow hut, on the 6th of May, situate on Point de la Guiche, was, by good observations, found to be in lat. $68^{\circ} 57' 52''$ N., long. $94^{\circ} 32' 58''$ W. One of my men, Mistegan, an Indian of great intelligence and activity, was

* A number of rocky elevations to the north of the river were mistaken by Simpson for islands, and named by him "the Committee."

sent 6 miles farther along the coast northwards. By ascending some rough ice at its extreme point he could see about 5 miles farther. The land was still trending northward, whilst to the N.W., at a considerable distance, perhaps 12 or 14 miles, there was an appearance of land, the channel between which and the point where he stood being full of rough ice. This land, if it was such, is probably part of Matty Island, or King William Land, which latter is also clearly an island.

I am happy to say that on the present, as on a former occasion, where my survey met that of Sir James C. Ross, a very singular agreement exists, considering the circumstances under which our surveys have been taken.

The foggy and snowy weather, which continued for upwards of four days, had occasioned the loss of so much time, that although I could easily have completed a part (perhaps the half) of the survey of the coast between the Magnetic Pole and Bellot Strait, or Brentford Bay, I could not do the whole without great risk to my party, and I therefore decided upon returning.

Having taken possession of our discoveries in the usual form, and built a cairn, we commenced our return on the night of the 6th. Having fine clear weather we made long marches, and at Shepherd Bay, having got rid of the sledge which I had hitherto hauled, I detached myself from the party, and examined the bay within a mile or two of the shore, whilst my men took a straighter route.

Thick weather again came on as we entered the bay (named in honour of Sir Robert H. Inglis) into which the Murchison falls, and we had much trouble in finding the mouth of the river. Here the services of my Cree hunter were of much value, as custom had caused him to notice indications and marks which would have escaped the observation of a person less acute and experienced.

On the 11th of May, at 3 A.M., we reached the place where our two men had been left. Both were as well as I could hope for; the one whose great toe had been frozen, and which was about to slough off at the first joint (thereby rendering the foot very tender and painful when walking in deep snow), had too much spirit to allow himself to be hauled. One deer and eighteen partridges had been shot, but, notwithstanding, I found a greater reduction in our stock of provisions than I had anticipated, and I felt confirmed in the course I had taken.

The day became very fine, and observations were taken which gave the position of "Cache" Island, where our snow-hut was, lat. $68^{\circ} 32' 2''$ N., long. $93^{\circ} 24' 18''$ W.

Having completed my observations, and filled in rough tracings of the coast line, which I generally did from day to day, we started for home at 8:30 P.M. The weather being now fine, and the snow harder than when outward-bound, we advanced more rapidly, and in a straight direction, until we came to the lakes, about midway in the isthmus, after which, as far as Pelly Bay, our outward and homeward routes were exactly alike. We reached Pelly Bay at 1 A.M. on the 17th, and built a snow-house about $2\frac{1}{2}$ miles S., and the same distance W., of my observations of the 20th of April.

Observing traces of Esquimaux, two men were sent after supper to look for them. After eight hours' absence they returned with ten or twelve native men, women, and children. From these people I bought a silver spoon and fork. The initials F. R. M. C., not engraved, but scratched with a sharp instrument on the spoon, puzzled me much, as I knew not at the time the Christian names of the officers of Sir John Franklin's expedition, and thought possibly that the letters above-named might be the initials of Captain McClure, the small "c" between the M. C. being omitted.

Two of the Esquimaux (one of them I had seen in 1847) offered for a consideration to accompany us a day or two's march with a sledge and dogs. We

were detained some time by the slow preparation of our new allies, but we soon made up for lost time, and after a journey of 16 geographical, or about 184 statute miles, we arrived at the E. side of the bay in latitude by reduction to the meridian $68^{\circ} 23' 10''$ N., long. $90^{\circ} 9' 39''$ W.

It may be remembered that in the spring of 1847 I did not trace the shore of Pelly Bay, but saw it from the summit of one of the lofty islands in the bay. Desirous of being always within rather than of exceeding the limits of truth, I, that year, placed the head of the bay about 10 miles N. of what it ought to have been, a mistake which will be easily accounted for by those who know the difficulties of estimating distances in a snow-clad country, where the height of the land is unknown.

The width of the isthmus separating Pelly and Shepherd Bays is fully 60 geographical miles.

In the evening, before parting with our Esquimaux assistants, we bought a dog from them, and after a most friendly farewell resumed our journey eastward, and found on a long lake some old snow-houses, in which we took up our lodgings. Here a set of good observations placed us in lat. $68^{\circ} 12' 18''$ N., long. $89^{\circ} 35' 51''$ W., variation 81° W.

On the morning of the 21st we arrived at Committee Bay: from thence our route to Repulse Bay was almost the same as before, and I shall not therefore advert to it farther than to mention that we arrived at our winter home at 5 A.M., on the 26th of May, having, from the better walking, travelled in twenty days the distance (less 40 or 50 miles) which had taken us thirty-six days to accomplish on our outward journey.

I found the three men who had been left in charge of the property quite well, living in abundance, and on the most friendly terms with a number of Esquimaux families who had pitched their tents near them.

The natives had behaved in the most exemplary manner, and many of them who were short of food, in compliance with my orders to that effect, had been supplied with venison from our stores.

It was from this time until August that I had opportunities of questioning the Esquimaux regarding the information which I had already obtained of the party of whites who had perished of starvation, and of eliciting the particulars connected with that sad event, the substance of which I have already stated.

In the early part of July the salmon came from the sea to the mouths of the rivers and brooks which were at that date open, and we caught numbers of them, so that occasionally we could afford to supply our native friends with fifty or one hundred in a night. As is the usual custom at the Hudson's Bay Company's inland trading posts, all provisions were given gratis, and they were much more gratefully received by the Esquimaux than by the more southerly and more favoured red man.

We had still on hand half of our three months' stock of pemican and a sufficiency of ammunition to provide for the wants of another winter. We were all in excellent health, and could get as many dogs as we required, so that (D.V.) there was little doubt that a second attempt to complete the survey would be successful; but I now thought that I had a higher duty to attend to, that duty being to communicate with as little loss of time as possible the melancholy tidings which I had heard, and thereby save the risk of more valuable lives being jeopardized in a fruitless search in a direction where there was not the slightest prospect of obtaining any information. I trust this will be deemed a sufficiently good reason for my return.

The summer was extremely cold and backward: we could not leave Repulse Bay until the 4th of August, and on the 6th had much difficulty in rounding Cape Hope. From thence, as far as Cape Fullarton, the strait between Southampton Island and the main shore was fully packed with ice,

which gave us great trouble. S. of Cape Fullarton we got into open water. On the evening of the 19th calms and head-winds much retarded us, so that we did not enter Churchill River until the morning of the 26th of August; there we were detained all day by a storm of wind. My good interpreter, William Ouligback, was lauded, and before bidding him farewell I presented him with a very handsomely mounted hunting-knife, intrusted to me by Captain Sir George Back, for his former travelling companion Ouligback, but as the old man was dead I took the liberty of giving it to his son as an inducement to future good conduct, should his services be again required.

A three days' run brought us to York Factory, at which place we landed all well on the forenoon of the 31st of August. I am happy to say that the conduct of my men, under circumstances often very trying, was, generally speaking, extremely good and praiseworthy; and although their wages were higher than those of any party who have hitherto been employed on boat expeditions, I thought it advisable, after consulting with chief factor William Mactavish, to give each a small gratuity, varying the amount according to merit.

In conclusion, I have to express my regret that I was unable on this occasion to bring to a successful termination an expedition which I had myself planned and projected, but in extenuation of my failure I may mention that I was met by an accumulation of obstacles beyond the usual ones of storms and rough ice, which my former experience in Arctic travelling had not led me to anticipate.

I have, &c.

(Signed)

JOHN RAE, F.R.G.S.

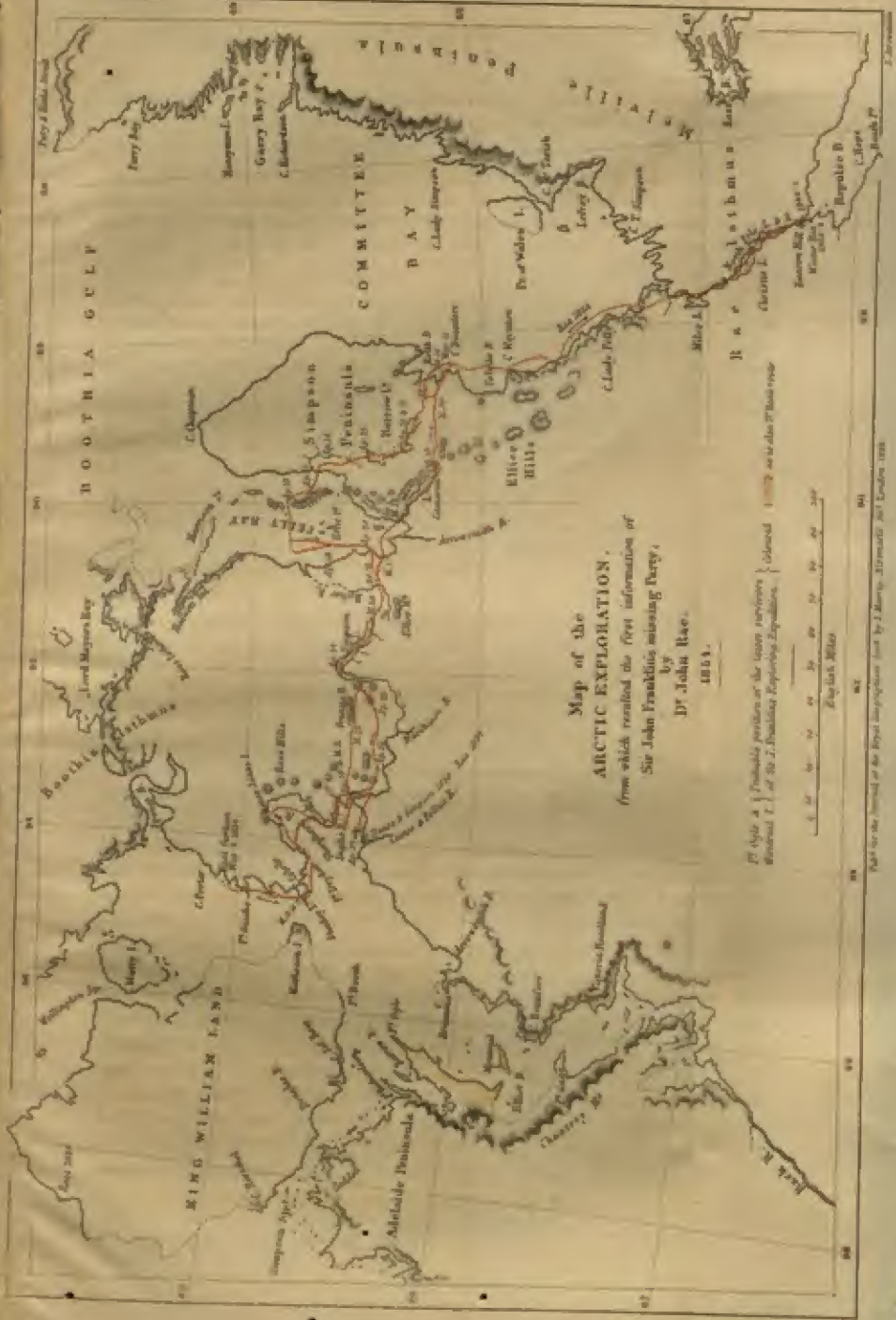
XIX.—*Remarks on a series of three-hourly Meteorological and other Observations made during a Passage from London to Algoa Bay, from July to October, 1853.** By Dr. P. C. SUTHERLAND, F.R.G.S.

Read, March 12, 1855.

To the SECRETARY of the Royal Geographical Society.

SIR,—I hope you will excuse the liberty I take in forwarding the accompanying "three-hourly" observations in meteorology, &c., made during the passage of the ship 'Ambassador' from London to Algoa Bay, South Africa. They extend over a period of nearly four months—July, August, September, and October of this year—and embrace the temperature of the air and of the surface of the sea, together with the density of the latter; the variations of the atmospherical pressure; the true directions of the winds and their force; the general features of the weather; and allusions, made as frequently as circumstances permitted, to the countless inhabitants of the parts of the ocean traversed. As the geographical distribution of animals has always, and more especially of late years, met with marked attention from your Society, I doubt

* The tables are preserved in the archives of the Society.—ED.



Map of the
ARCTIC EXPLORATION.
from which resulted the first information of
Sir John Franklin missing party,
by
Dr John Rae.
1854.

Pl. 101. 1. 1. Probable position of the lower river
discovered by the Thelon River Expedition. 1854.

English Miles
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 310 320 330 340 350 360 370 380 390 400 410 420 430 440 450 460 470 480 490 500 510 520 530 540 550 560 570 580 590 600 610 620 630 640 650 660 670 680 690 700 710 720 730 740 750 760 770 780 790 800 810 820 830 840 850 860 870 880 890 900 910 920 930 940 950 960 970 980 990 1000



not a few observations on this head might prove interesting: such would perhaps be out of place here, as they might anticipate the more extended remarks which Dr. Gray, of the British Museum, or some of his able assistants, may kindly undertake to offer upon the series of collected specimens, the results of the towing-net during the passage, already forwarded to that national institution. It may, however, be proper to observe, that every part of the ocean where the towing-net could be applied satisfactorily, for the purpose of including whatever came into its way, was found to contain crustacea, chiefly of the Entomostracous orders, in considerable abundance. The genus *Cypridina*, of which but little is known, and in some instances supposed to be dredged from depths of sixty to seventy fathoms on the British coasts, was found of large size at the surface of the ocean in both the northern and southern hemispheres, in localities determined astronomically, where Sir J. Clark Ross failed to strike soundings with 2000 fathoms of line. This genus, however, has been found in several parts of the Southern Ocean by Mr. Adams, Assistant Surgeon R.N., and other travellers.* The genus *Anomalocera*, and several other closely allied genera of this widely distributed order, hitherto chiefly confined to the British seas and most northern parts of the North Atlantic, were found extending southward of the Equator—species apparently the same having been taken in the English Channel, the Bay of Biscay, and in 4° to 6° of S. lat., on the 20th to the 25th meridian of W. long. In no part, however, traversed during the passage did this order occur as on the Agulhas Bank, where many thousands of the most beautiful and lively creatures were often found to be included in the net after two or three minutes' towing over the stern of the ship during almost a perfect calm. In the daytime it was remarkable how few of the *Entomostracous* order, or even of any crustacea, were taken up when the net was towed along the surface: when lowered with a weight to a depth of 10 to 20 fathoms the success was much better; but still the numbers taken under the most favourable circumstances during broad daylight were only an infinitesimal fraction of the myriads taken from the surface after nightfall. A few mollusca, the young of the *Argonaut*, several species of *Pteropods*, the beautiful purple Atlantic gastropod, *Ianthina fragilis*, and a few tetigerous annelides, were taken in much the same proportion by night as by day; and, as might be expected, aculeph forms were also found equally numerous in daylight and after night had set in. This fact, with respect to the habits of marine animals, and the periods at which they resort to the surface of the water, is worthy the notice of naturalists, as it may in some measure

* Baird's British Entomostraca.

account for the paucity of crustacean forms, not unfrequently complained of by several most careful observers.

The barometric observations, although made with the aneroid, an instrument deservedly excluded from scientific pursuits, may not be altogether valueless, as the error of the one in my possession was carefully ascertained by the Secretary of the British Meteorological Society.* In the N.E. and on the E. trade-winds, where atmospheric disturbances are unusual, the diurnal variation of the pressure, supposed to depend upon some obscure hygro-metric state of the air, is shown, I think, with tolerable accuracy; and in other latitudes in the N. and S. Atlantic, the variations peculiar to atmospheric vicissitudes are indicated equally well.

The thermometric observations may not be unimportant, as they apply to considerable portions of the currents in the N. and S. Atlantic. The errors of the thermometers used were found by comparisons with Negretti and Zambra's patent standard thermometer, the correctness of which was proved by a certificate from Mr. Glaisher.

Before reaching the Equator a decided diminution in the temperature of the water was observed, which, after making all due allowance for the N. declination of the sun at the time, showed that the ship had passed into the Equatorial current; this current being of a temperature comparatively low for a position so near the Equator, owing, I suppose, to its rapid advance from the southward: and after getting into the northern connecting current, which is quite beyond the immediate influence of the tropical winds, the change of the weather in point of severity and coldness became too striking to be passed unheeded. In lat. $35\frac{1}{2}^{\circ}$ and long. 9° E., 400 miles W. of the Cape of Good Hope, during westerly gales, showers of hail continued falling for three or four consecutive days, to the extent of covering the ship's deck. I little expected, except from icebergs, which rarely drift so far northward, that, within 12° of the tropic of Capricorn, the means for testing the freezing and zero points of thermometers could have come from natural resources on the surface of the wide ocean. As we advanced north-eastward in the direction of the Agulhas Bank, the temperature of the sea increased, until, at a distance of 70 miles S. of the Cape of Good Hope, the mean was about 61° , at which it was found to remain, with slight variations arising from clear or cloudy weather, as we moved along the Bank and

* Although this instrument is totally useless at considerable elevations, it is due to its inventor to state, that under such variations of the atmospheric pressure as are common at the sea level, its indications are generally uniform with those of the mercurial barometer, differing, however, in every individual instrument by an error of addition or subtraction, that in the present instance being 0.15 inch of subtraction.

entered Algoa Bay. Proceeding eastward, close along the land from Cape St. Francis, which is 40 to 50 miles westward of Cape Recife, the promontory on the W. side of this bay, Captain Moore, of the 'Ambassador,' was of the opinion that a slight easterly current must have carried his ship in the direction of Algoa Bay, which he entered earlier than the correctly measured distance between the two capes, and the time occupied in running it down, would warrant. Captain Boxer, of this ship, who has been engaged for a considerable time in the Royal Mail General Screw Steam Company's service along the S. African coast, also says that the current flowing out of the Mozambique Channel, parallel with and close to these shores, loses its force very considerably before it reaches Algoa Bay, to the westward of which its influence is scarcely felt at a distance of 10 to 12 miles from the land. He adds, however, that the force of the current from Natal southward, is affected to a great extent by the prevailing direction of the winds, a circumstance which ought always to find a place in the calculations of persons engaged in estimating the position and direction of the currents of the ocean. The neutral testimony of Captain Boxer, and that of a more positive nature from Captain Moore, in my estimation, favour the probability that there is a slight eastward counter-current from Cape Agulhas to East London on the Buffalo River, about long. 27° , which carries along the included portion of the coast a body of colder water from the southward than that of the current from the Mozambique Channel. The bays eastward of Cape Agulhas have a spit of fine sand pointing eastward from the promontory on their W. side, which could not possibly exist were the current advancing westward. The Zwartkops, a river which empties itself into Algoa Bay, I am informed by Mr. Gadney, a gentleman of great experience in S. Africa, runs straight out, and deposits its sand and fine detrital matter equally on both sides, thus affording an unexceptionable proof that its water is not deflected by currents to either side. At East London, and thence north-eastward as far as our knowledge of the coast extends, the rivers cut away their *west* bank, and deposit a long bar or spit of sand on the opposite or *east* bank—a circumstance which shows, without much room for doubt, that the prevailing direction of the current on the coast is westward. The temperature of the sea surface off Cape Agulhas, at Algoa Bay and in the vicinity of the Buffalo River, was found to be generally 61° in the month of October; whereas 60 miles north-eastward of the latter locality it was 68° ; and 90 miles farther, where the current from N.E. is very strong, it was 72° . This increased warmth of the water with the decrease of the latitude may be accounted for, in some measure, by the increased power of the sun, but not to the above unusual extent: it is there-

fore necessary to refer its chief cause to the direction of the current, which is well known to be from N.E. to S.W. The low temperature observed at Algoa Bay, and some distance E. and W. of it, may, with equal propriety, be referred to the eastward deflection of a colder current from the southward; which deflection, as has been already observed, may satisfactorily account for the direction of the sand spits on the W. side of the bays. There seem to be some exceedingly anomalous windings in the currents at the Cape of Good Hope, as laid down in hydrographical works, which perplexed Sir James Clark Ross when he rounded that promontory in his Antarctic voyage, and he would have been glad to have examined them more fully, had his important mission farther S. permitted of the necessary delay. His remarks, in offering the observations made at that time, are highly encouraging to all engaged in the same field of physical research: they are not, however, the only encouragement, for your late President observed in the Anniversary Address for this year, at which I had the pleasure and the privilege of being present, "that it would prove worthy of this maritime nation to perform a survey of the currents of the ocean." When this work is undertaken, the temperature of the water, and its minute, in many instances, microscopic inhabitants, will occupy a share of attention scarcely second to any of the chief points under consideration. With such a plea, I need not apologise farther for troubling you with the observations I now have the pleasure to inclose to you. Some of the Fellows of the Society, interested in the researches alluded to, may indulge me with a glance at them, and I remain very faithfully

Your much obliged servant,
P. C. SUTHERLAND.

Dr. Norton Shaw.

XX.—*Narrative of a Journey from Cairo to Jerusalem, viâ Mount Sinai.* By the late Dr. GEO. A. WALLIN, Professor of Arabic at the University of Helsingfors.

Translated and communicated by Dr. SHAW.

Read, July 12, 1854.

I HAVE now spent several days in Jerusalem, but having received a most disagreeable impression of the Holy City, caused by the rain, cold, and snow, as well as by the inhospitality of its morose inhabitants, I will postpone giving any decided judgment until sunshine and fine weather will allow me to walk about and survey the disorder of the present Zion. You must therefore in the meanwhile be satisfied with some account of occurrences in the Desert and on Mount Sinai. During my eight months' stay in Cairo, after my first

excursion to the Desert, low-spirited and longing for news from home, I had become so disgusted with that city, that I resolved to exchange it for any other place in the world. Your letter to Bakty, which was anything but consoling, hastened my departure, and I left the house I occupied and returned to my friendly Sheikh, who always receives me with open arms. Here I settled my affairs, and made the necessary purchases for my wallet, consisting of flour, rice, and butter, besides coffee and other articles. After which I addressed two Towara Beduins in the street, and informed them of my intention of proceeding to their native country and to the Convent of Sinai; pointed out to them the house of my Sheikh, and begged them to meet me there the following day to settle the contract for the journey if they were inclined to undertake to be my guides. They insisted on settling the conditions at once, and endeavoured to force me to do so by repeating the *fâtihe*,* which to my surprise they were able to recite pretty correctly. But I knew my men too well to appear anxious to enter into any hurried agreement, and left them with the assurance that I would not settle anything before the next day, and that I would not read the *fâtihe* with them. They then wanted to persuade me to give them a plaster beforehand, but I was immovable. The next morning they met at the Sheikh's and took tea with me: later in the day I had a luncheon, consisting of bread, butter, and molasses, served up to them; and after they had swallowed everything that was placed before them with true Beduin greediness and presumption, we entered upon the settling of the conditions for the journey, &c. All such bargains are here carried on very slowly and with much higgling, and many words and thousands of oaths by the Prophet and his beard, &c. I made them abate one-third of the usual price, and after several more hours' talk, when both parties were agreed, and the departure was fixed for the 7th of December, we all repeated the *fâtihe*, and I suffered myself to be persuaded, but not without much swearing by my beard and kissing of the same, to pay beforehand the whole amount for the hire of the camels. The next morning my guide, the Beduin, came again, accompanied by a stranger. Having enjoyed another meal of bread, molasses, and butter, we loaded the camel they had brought with my light baggage, and I put on my much-loved light Beduin costume and set off. By the bribe of a plaster I escaped the visitation at the gate, of which I was somewhat afraid, on account of the quantity of coffee I carried with me. We stopped once more at a stable in one of the suburbs of Cairo to purchase provender for the camel during the journey, the Desert being, as I was assured, so dried up, that not even the camel would be able to find his scanty food. Here my Beduin left me, having, as is usual with the people here, many little errands to perform at the last moment, and placing the halter in the hand of a Beduin lad of about ten years of age, with the order to lead me and the camel to his party, which encamped in the Desert, about one hour's march from the city. On my way I was tempted, by the newly ripened oranges, to stop and increase my scanty provisions for the journey with sixteen of this delicious fruit, all for one plaster. While I made this purchase the Beduin had proceeded on his way (as usual), and when I lifted up my eyes from the fruit-basket, the beast and its leader had disappeared; they had diverged into a by-way, and I continuing my way straightforward, placed a greater distance between us. This vexed me a little, for it took me several hours to find the Beduin party in their encampment in the Desert; but I consoled myself with the thought, that if the commencement of the journey was encumbered with difficulties, the continuation and the end might be so much the happier. When I had found the Beduins I sat down, in the heat of the afternoon, at a blazing fire and

* i. e. the first Chapter of the Koran.

prepared my coffee. During the preparation of this refreshing beverage I reproached my travelling companions, and especially my guide, for having caused me this long and fatiguing walk. But I was in the Desert, and there, *volens volens*, one must learn to be patient. We had hardly finished our coffee before we began to load and started. My camel had got a double load of wheat, which my Beduin took home for his wife and child, besides its own provender for the journey; our caravan consisting of fifteen loaded camels. Although the whole route is perfectly secure, travellers generally go in large parties to assist each other to watch in the night; for here, as everywhere in the neighbourhood of cities, one fears thieves, who during the night will steal the luggage.

The road to Suez is now a lively highway, almost as much frequented by passengers as the streets of Cairo. At every fourth or fifth hour we came to an inn or stage for changing horses, and still oftener to a station belonging to the Pacha's telegraph line to Suez. We incessantly met caravans coming or returning, loaded with the most various articles, foot-passengers, or people riding on horses or donkeys. I do not like this country, for it is neither desert nor cultivated, as you scarcely see any of the scanty herbs of the Desert, and hardly find fuel for your coffee. I employed my time in practising my feet, which by my long sojourn at Cairo were unaccustomed to the sand and stones of the Desert. At first I was only able to walk one or two hours barefooted, but I soon hardened the soles of my feet, and after ten days was able to walk almost the whole day without shoes. We proceeded slowly, lay down to rest before sunset, and loaded long after sunrise; came several times in contact with Fellâhs, the natural enemies of the Beduin, and who now, with their stronger and better conditioned camels, begin to compete with the Beduins as guides on this road. I had no object for my journey but to live in the fresh Desert and among its children, and as I found my present company satisfactory, I had no reason to accelerate our march.

There is a continual hatred and warfare between the Fellâh and the Beduin; the latter is chivalrous, the former mean: both have their good and bad qualities, yet one finds more noble traits in the character of the Beduin than in that of the Fellâh. The Beduin will rob you in the Desert, which he, according to his views, has a right to do, and will let you proceed on your way almost naked, with a little bread and water; the Fellâh will steal a penny from your purse or a morsel from your wallet, and call you his master, and is your humble servant, and swear by Allah and his Prophet that he is an honest man.

We did not reach Suez before Friday, December 11, about noon. Here I was told that no one who came from Cairo was admitted to the Convent of Sinai without bringing a letter of introduction from the Prior of the Greek Convent of this city. I had taken no notice of this custom on my departure from Cairo, although I was well aware of it, and had only a note in Arabic from our Consular office, as I wished to avoid meeting with the Greek monks and their inquiries about my religion. Here in Suez, however, I was advised to take a letter from the correspondent of the Convent for the sake of security. I found out this man, a Mosaic Christian, acquainted him with my business, and showed him my passport from our Vice-consul in Cairo. On learning from this that I was a Russian subject, he, and five or six other Copts who were present, began to inquire about Russia and its condition; whether there were cities as great as Cairo, and soldiers as well disciplined as those belonging to the Pacha? I answered, that in Russia there were no cities so poor and dilapidated as Cairo, that the Emperor's stable was far more splendid than the palace of the Pacha, and his simplest soldier superior to an Egyptian general. They subsequently mentioned how powerful Russian protection is in the East, and how the Turks and their Sultan fear their powerful neigh-

bour. Meanwhile I had been offered a cup of coffee and a pipe, and after the man had dictated to a bystanding clerk a letter in my behalf addressed to the directors of the Convent of Sinai, he began to put to me all sorts of questions about Islam, to which he took me to belong. Not having found me the sullen, proud, Turkish Mussulman, he thought he might allow himself some of these subtle remarks which the Copts occasionally make to the more liberal adherents of severe and gloomy Islam, as to their faith, for instance; that to make a perfect prayer it is requisite to enjoy good health, and to be in possession of all one's limbs; that a man who has lost an arm or a leg cannot make an impressive prayer. He then quoted several verses from the Koran in support of his assertion. I could hardly refrain from laughing at his sophistical remarks, and was glad to hear the bystanders begin to ask me about the Russian words of command for the military exercise. I told them what I knew of this; the rest I supplied with the first words that came to mind of my mother tongue. This examination had lasted for more than half an hour, when I thanked them and took my leave with many wishes for a successful journey. My Beduin had meanwhile made several purchases, and now came to accelerate our departure. I went with him to the only market-place to be found here, and after having bought some meat for our supper and a few dates for a refreshment in the Desert, we repaired to our baggage and companions, whom we had left to the care of some Beduins encamped outside the city. The numerous party with which we had come hither, and which now had unloaded their large packages, were to return the following day to Cairo with a cargo of coffee. Only one young Beduin lad, with two camels almost overloaded with heavy sacks of wheat for his family, was to follow us. My Beduin possessed two camels, that on which I rode, and a young camel of two years, which we had loaded but slightly. Our beasts were thus four, all nearly laden beyond their strength, and besides so severely tried by hunger, that hardly anything was to be seen of their humps. We set out a few hours before sunset, and having passed round the extremity of the Bay of Suez, encamped in a snug valley in the Desert, where we found abundant fuel for our coffee and meat. Meat is here generally the food the most relished, and whenever it is eaten, it is considered a feast; so it was to my Beduin, who assured me that he had not tasted meat for two months, although he had been in Cairo during the slaughter month (*Zu'l Hijjah*). He was inexhaustible in praise of my liberality while he, after having finished the meat, sat gnawing the bones, which he and our third companion cleared so perfectly, that I doubt much whether a dog would have found anything on them.

The following day, the 12th of December, the journey through the Desert began in reality. Hitherto we had had a sufficient supply of our baked bread from Cairo, and the road had resembled a street more than a desert. We had even till now had a store of the delicious water of the Nile; but before us were only the Wells of Moses with the bitter salt water of the Desert. Yet in this season one does not suffer much from thirst, and I hardly remember during the whole journey having to open my water bag except for the purpose of making coffee and dinner, for which reason I was called "*sabbâr*," i. e. the patient, and reckoned one of them.

Early the next morning we rose and began to prepare our coffee and our breakfast. As it is everywhere in the Desert a repetition of the same actions, with very little variation, I will for once invite you to a breakfast and a supper in a small Beduin party. But as it is to take place here, I will, as in the East, begin the day by sunset, and not by sunrise.

Imagine yourself wandering about the whole day in the Desert, sometimes riding on a jolting camel, sometimes walking under a burning sun, such as we have in our hottest summer months in Finland, without any other refresh-

ment than now and then a pinch of snuff and a lively chat with your Beduin party; before your eyes a landscape dried up by the sun, with a few withered herbs or perhaps the blue line of the Red Sea in the distance; tired as you are, you wait with impatience for the setting of the sun, and the lower he sinks the more frequently you will repeat the question to your Beduin party, "Are we not soon to take up our night quarters?" The Beduin, who is easily satisfied when his camel does not suffer from hunger and thirst, rarely refuses to conform to your wishes, and will stop in any valley where he can find, if ever so sparingly, fodder for his beloved animal, and wood for cooking his own supper. The place is now chosen, and the Beduin takes hold of the halter of his beast, which the whole day has been allowed to go about freely, only now and then reminded by the stick to accelerate his slow march, and leads it to the place which he finds suitable, generally in the shade of some bushes. Now he cries to the camel, "Ikh, ikh;" and if it is stubborn, he slaps it on the neck with his hand or stick to make it kneel down. The prudent animal often stands for a long time scraping and tramping to smooth the place in order not to hurt itself when it falls down with its heavy load. Meanwhile it utters a low moaning sound. If it is unruly, and will not lie down on the place its master has chosen, he takes it by the tail and directs it in this manner at will. At last it falls down carefully on its fore-legs, and after that it bends its hind-legs as cautiously, resting its large body on these and on a great thick gristly hump under the belly, between the fore-legs. The load is quickly removed and the animal is allowed to get up, and after having given itself a shake it is left at liberty to seek its food in the Desert on herbs and bushes. Hardly has the Beduin let go his beast, and left it to itself, before he repairs to the nearest shrubs to seek fuel. He soon brings back a great bundle of all kinds of dry roots and stems of bushes, or a load of camel-dung, of which there is abundance almost everywhere in the Desert. He strikes fire with his steel and blows from his tinder (generally prepared of herbs from the Desert) fire into the broken camel-dung, and within a minute you have a blazing fire. Whether the evening be cold or hot, the Beduin always warms himself by the fire, first his hands and then his feet, which he sticks into the middle of the flame, and often employs as fire-tongs to put the firebrands in place. After this he lifts up his long dress and steps across the fire, letting the flame blaze up on his stomach and back. This refreshes him, and he goes again in search of more wood, sufficient for the evening and following morning. Meanwhile I have set about roasting our coffee and grinding it between two stones, and generally I have it ready by the time my companions bring the last load of fuel. A good cup of coffee is the most delicious beverage in the Desert, even without sugar, as it is mostly taken here. I have rarely drunk tea, although I always have it with me on my travels. Besides, the water one gets in the Desert is seldom fit for tea, but is very good for making coffee. When the coffee is taken, one begins to think of the supper. On my former travels I never had anything to do with cooking, but left it to my attendants; but on this journey I every evening cooked our rice with pepper and onions, and a little flour. This dish has invariably been my supper on the whole journey. I always take my meals in company with my guides, never alone, and never forget to say to all present "*bismilla*," i. e. in the name of Allah. This is the custom of the Beduin, and this conduct put me in great favour with them: they called me Arab and Beduin, and made a great distinction between me and the hated inhabitant of cities. Meanwhile we have made use of our hands (not fingers) to eat our rice, and while I, with the exclamation "*Allhamdo lillah*," i. e. "Allah be praised," wash my hands, the Beduin takes up our little saucepan, and in the true sense of the word licks it clean. During these transactions the Beduin has been obliged to keep his eye on his beast, because it walks among the bushes. It often happens, that a camel runs away from

his master, which occurred on the road to Suez, to one of our companions who had let his camel loose, while he gathered fuel.

The man was *moonblind* (which is frequently the case here), and when the sun had set the camel disappeared from his view and was lost. If there is plenty of fodder, one ties the forefeet together with a rope (*teklid*), and the camel is allowed to walk about as he can. But as there was but little fodder here, and the camel had to be fed with beans, he came uncalled to his sack of provender. When the animal has made his scanty meal he is made to kneel down on the place his master has looked out for him, and his foot is tied up to his thigh by a rope (*shokd*), that he may not get up in the night and run away. Now all important preparations are at an end, and the party sits down to take coffee and spend the evening with merry chat. The Beduins and other Orientals generally sleep less than we do, and neither in the Desert nor in towns is it the custom to go to bed before midnight. The topics of conversation are generally travelling adventures and razzias, and the number of sheep and goats that have been killed by liberal men, and the rich rice puddings with which they have treated them. The thoughts of the Beduin are constantly turned on food, especially meat and butter. Besides this he speaks of the internal relations of his tribe, and its relations to other tribes, but of these only with Beduins, as few other people know their relations. He is in general rather talkative, and whether busy or at rest, is hardly ever silent, if he has but some one to chat with who understands him. If two Beduins are together, they prate incessantly; but with a townsman who does not understand his language well, and does not know his relations in the Desert, he will often remain silent the whole day, yet he will always answer him if he begins a conversation. I have never found Burckhardt's statement corroborated, that the Beduin on a hot day keeps silence in order not to dry his throat, and thus cause thirst. On the contrary, their mouth is for ever in activity, and when the conversation stops they begin to recite verses or to sing. They are all in possession of a great stock of songs. Their manner of recitation is remarkably clear and pure, and to my taste far more beautiful than the declamation which by us is studied as an art. The auditors generally repeat the last word of the verse, probably in order to mark out the rhyme. Their songs treat mostly of the same subjects as their conversation, expeditions against neighbouring tribes, liberal men, &c. Thus about three hours of the night have been beguiled with talk and song when one begins to prepare one's bed. All the luggage is now piled up against that side from which the wind is expected in the night, in order to protect against the cold. I very often disagreed with my Towara Beduin about this point. We had always different opinions about the weather: he generally proved to be in the wrong, and when later in the morning I reproached him for not having taken my advice in piling up our luggage, he always answered that if he had done so the wind would have come from another quarter. I was well supplied with clothes, and especially with a so-called Greek capote, of a kind of thick felt, through which neither cold, rain, nor wind could penetrate, so that I did not fear the weather, cold as it was during all this time. The Beduin, before he lies down to sleep, takes off his shirt and turns his back, naked to the middle, to the fire, and lets the flame warm that and the rest of his body on all sides. In this manner he gets the upper part of his back and the chest right before the blaze, and meanwhile scratches his body, puffing and panting with enjoyment. Without this manœuvre, he says that he cannot go to sleep. I have on this journey had great occasion to wonder at the Beduin's endurance of cold. Already on our leaving Cairo we had during the night 2° Centigrade, and a heavy dew. Higher up toward Syria I believe that it was often as low as zero. I had taken with me a thermometer from Cairo, but was so unlucky as to break it after only ten days'

use. This was very provoking, as very interesting observations might have been made on this journey. During this comparatively severe cold, the Beduin has nothing to protect him from its effects but a thin threadbare coat, and for his bed nothing but his shirt, or perhaps a sack spread on the ground. He often suffers much from the cold, and sometimes he will even get up in the night to revive the fire and warm his benumbed limbs, and one rarely finds a fullgrown Beduin who does not suffer from rheumatism and cough. I, though born and bred in our cold northern country, needed all the clothes I had, and although they were thick and numerous, I was hardly ever warm; I however escaped rheumatism. As for the rest, I do not ever remember to have enjoyed sleep so comfortable and refreshing as in the Desert, and to this I believe that I must chiefly ascribe my having been able to go through so many hardships without indisposition in my very toilsome travels. It happens, when I retire to rest in towns and cities, that I dream of robberies and fights on my impending journeys; but in the Desert my dreams are always about you and my home, with the happiest remembrances of my childhood and youth; and however tired I have lain down to rest, I always feel refreshed and enlivened the next morning, and able to set out on my journey with renewed strength. Yet it is especially in summer, after a burning hot day, that one really appreciates the delicious coolness of the night. A short time before sunrise, at the dawn of day, one generally rises with the words "Ashado ann la ilaha illallah wa ashado anna Muhāmmadan resulollah," i. e. I confess that there is no other God but Allah, and that Muhammed is his Prophet. This is a continual exclamation, yet less frequent with the child of the Desert than with the townsman, who often repeats it later in his sleep, and every time he awakens.

This sentence pronounced, another blows the fire, which the preceding evening was buried under the ashes, and begins to make the coffee and prepare breakfast, which on this journey was as follows:—Out of my big flour-sack were taken eight or nine handfuls of flour and put into the saucepan. Meanwhile the Beduin has poured water from our big sack into a small teakettle, and washes his face and hands, while he repeats, "A'udso billāhi min ashshaitān a'udso billāhi min aulādelharām," i. e. "I flee to Allah from the Devil, I flee to Allah from man," and begins then to knead the flour with water, salt, and a little butter. The cake (termed *ka'k*, *bāita*, or *ghors*) is put by the side of the fire in the ashes, and embers are put over it. It is turned over, and within a quarter of an hour it is done, taken out, and scraped clean with a stick. It is an excellent, though somewhat hard-baked bread, and with dates, cheese, or butter, which I accidentally happened to have with me, one can, with a cup of coffee, make a good breakfast on it. While we take our meal, the camels are let loose to seek a breakfast in the Desert, as from the provender-sack is only bestowed fodder for supper. With good reason is this animal praised for its moderation. Its allowance of beans in the evening was no more than what a man might eat, and the food it now found in the Desert was hardly to be reckoned at all, as all plants stood dry and withered, and notwithstanding this, it made patiently its long march of 8 to 10 hours with a heavy load. It is a most moderate animal, and yet at times perhaps the most immoderate, and resembles in this, as in so many other regards, its master the Beduin. During spring, when its master lies immovable in his tent all day long, drinking milk and eating butter, and kills sheep for his guests, the camel without a driver or keeper wanders into the Desert, eating and resting night and day. During the summer-time and the beginning of winter, when the Desert withers, the Beduin repairs to the town to seek freights (*faroe*), and he has then often to be satisfied with one small loaf for a day with a few dates, and his camel must live on his hump. A Beduin, be he ever so full, can always eat whatever you place before him,

and if he have nothing, he can live for two days and more without any food at all. If you give him much, he will consume all; if you give him but little, he will be satisfied. If he have water in his bag, he drinks often and with pleasure on the hot and fatiguing journey; if he have none, he suffers thirst without murmuring. He is always content, talkative, and indomitable under fatigue. The same is the case with the camel, to whom, as his master always says, God has given more patience than to any other animal. After we have finished breakfast the packages of each beast are arranged and piled up in two equal parts with a small space between them. The camels are fetched from the fodder, but not without reluctance, for they know well what is to come. The first beast is led to its load by the halter, and is bid by the call of "ikh ikh!" to fall on its knees between the two piles. Now it often happens that it with a tug tears itself loose from its master and runs away. Yet it does not get far before it is caught again, and addressed by the Beduin as follows: "Oh, you fool, do you think to be wiser than I? where will you go that I should not find you?" By this friendly address, and a few tugs at the halter, the gentle animal is persuaded to follow his master, and fall down on the appointed place between the piles of luggage. If the sacks are heavy, as in this case, three persons are required to pack: two persons lift up one sack and the third supports it with his knee, while the two lift up the sack on the other side. They are then fastened across the saddle of the camel with ropes, through which small sticks are stuck. During the loading the camel roars continually, throws his long neck backward and from side to side, and threatens to bite; he catches your knee or arm between his great teeth, but rarely really bites if you are not afraid. Nor does one take any notice of his rage, but only if he gets too troublesome gives him a slap on the muzzle and pronounces an oath, of which the rich fancy of the Beduin supplies him with a great stock. The tail during this operation is constantly bent upwards—a sure sign of the animal's wrath. If it finds that it is getting loaded too heavily, it often jumps up during the loading, and then it is brought down again and a rope often tied unmercifully tight round its neck and knee. When the whole load is fastened on, the animal is called upon to rise: it then always roars, bends its tail, and gives other signs of its indignation. When it has got up safely it is again contented, and performs its day's march without the least murmur, if it be but allowed to go on undisturbed. When everything is finished the Beduin warms his hands at the fire, on which he has laid the last fuel, and which he has such difficulty in leaving. At length everything is in order, and one sets out on the day's march. During the first morning hours everybody goes wrapped up in their cloaks, and hardly a word is spoken before the sun has risen. But with his first rays the birds awaken to song and the Beduin to talk. The first object that occupies his thoughts is his beast and its load, if it is well balanced; he peeps at one side and at the other, looks at the animal's step to see if it staggers on either hand, and does all he can to make the load easy for his beloved camel.

The Beduin says, the camel "is part of man's heart" (*gil'a min al qalb*), and he is not satisfied before he sees his beast pleased with an even load. Then he enters into conversation with his companion about the camel which is dearest to him, or about that which walks near him, its faults and its merits; he generally ends with these words—"Wallah ya akhi hia hürra," i.e. By Allah, my brother, she is of a noble race: she has only this or that fault; for instance, shies or stumbles now and then over a stone, and such like; then he walks up to her tail, scrapes it, and plucks off some big nasty insects called *da'lan*. This is almost the only way in which he shows his tenderness for his cherished animal. Patting, kissing, and other caresses, which one often sees bestowed among us on dogs, cats, horses, and other

animals, are never seen or used here. At first when, moved by a sincere regard for the excellent camel, I sometimes, in accordance with our custom, patted its neck, it roared and displayed its anger by opening its jaws. I have never seen a Beduin stroke either his camel or his horse, though the latter is his dearest possession in the world. This is characteristic here, for the women of the East likewise do not bestow such caresses as patting and kisses. Later the conversation turns on all sorts of topics. The thoughts of the Beduin change quickly as the winds of heaven. Invariably the first questions put to me by every Beduin are the following:—*Ya wali* or *'abdu wali*,* as the Beduin terms me. To this is answered, *kheja*, i.e. well, or *na'im*, i.e. at your service, or still more frequently among Beduins *'annak*, i.e. at your service. This is the introduction, to which succeed these questions—Have you any children? are you married? are your parents alive? and what has brought you from your home and country and made you travel? I answer these questions according to my humour at the time, or as I feel inclined to continue or interrupt the conversation. Sometimes that the Lord has blessed me with children by the dozen, sometimes with none, sometimes he has taken them all away again; sometimes I have four wives and slaves in abundance, sometimes I have married and am again separated, as I never found any that suited me; sometimes I have never married. Concerning the questions about my parents and other relations, I have generally answered them according to truth, only with a change of their name and place of residence. If the conversations stop, the Beduin begins to sing and hum. This song mostly consists of some word or some sentence, often improvised for the occasion, first hummed in a bass tone, then repeated one octave higher, and finally in the highest falsetto. Meanwhile he walks behind his beast, and drives it along with a small stick or with words alone.

The Beduin always lets his camel walk freely and untied, and if he rides he generally allows the halter to hang across its neck and directs it only with a stick, with which he points to the animal. The *Fellah*, who ties one to the other, leads the first by the halter. The usual words with which the Beduin encourages his beast to go on are, *Allah isallimik*, *Allah ihawarrin 'aleika*, i.e. May Allah preserve thee, may Allah make it light for you; or interjections such as *hitch*, *heij*: other words are for particular occasions, such as *irfa*, *ta 'al*, to call him back to the road, which the animal sometimes will leave. Moreover, the Beduin has a particular language which he speaks to his beast, and which it thoroughly understands, so that a child of three years, who speaks this language well, can make it obey far better than any stranger with halter and stick. Yet even the Beduin can sometimes be harsh in his words if it vexes him. If it too often diverges from the road to swallow a plant, he cries, "Cursed beast, may the Lord not allow you to fatten on that bite," &c. It is excessively amusing to hear the Beduin talk with his camel. I have often been forced to laugh aloud at his comic expressions, and often thought to hear the primitive root of words which later have passed into the language with the richest signification. When he begins to sing, the camel pricks up his little ears and accelerates his step after the time of the song. Upon the whole he is very gentle in the treatment of his camel. He rarely can find in his heart to strike it, and as it often during the march stops to eat, he places himself beside it and calls long and loud before he hits. The camel knows his master thoroughly, and cares as little for his words as the Beduin regards its groans and anger during the loading. They are indescribably intimate, and if it were not for this animal the deserts

* i.e. "O Saint," or "O servant of the Saint." The enterprising Doctor, as I am informed by Capt. Burton, was always called by the Beduins "*Haji Wali*," an abbreviation for *Wali el din*, Slave of the faith.—Ed.

of Arabia would be void and uninhabited. Without at least one camel no Arabian family can live. No wonder, therefore, if it has become a rule in the true old Arabic poetry to begin every poem with some verses in praise of the camel, and that this rule is still kept up and observed by the Arabian poets of the present time. I know that European travellers usually do not like this animal; they consider it cowardly and ill-made, and ascribe to it all sorts of bad qualities. As for me, I have a great fondness for it, not only for its infinite usefulness, but also for its own excellent make and calm, quiet, gentle disposition. It is true one must see Negd's graceful camels in order to be pleased with their shape, and not the Egyptian Fellah's thick-legged, clumsy animals, and one must see how it performs its four days' march without food and without water, with heavy burdens, and without a murmur, until it almost sinks down dead with fatigue, in order to be able to value and love it truly. Then one forgets the trouble its jolting, wearisome step causes the rider, and one assents with pleasure to the Beduin's affirmation, *al ille mulūk*, i.e. camels are kings. The relations of these animals to each other are very peculiar; they seek each other's company, and when they have made a journey of several days together, they are not to be separated without the greatest difficulty. The female camel will live intimately during the spring with a camel, if she has paired with him, but if not she will not suffer him to approach her. If any animal be interesting or deserving of a biography, it is indeed the camel of the Desert. I could relate many traits of resemblance between the Beduin and his animal, at which he, in fact, has no need to be ashamed, if I did not fear to tire you; one must in general see man as well as animals in their own country and their own circle in order to love them. This is the same case with the Beduin woman; she will refuse to marry a man who, before married, has had no heir; and if she has married one and lived with him the year round without becoming pregnant, she often forsakes his tent.

The morning hours pass usually quickly and unperceived in the Desert, the weather and the temperature being extraordinarily fresh and the Desert exhaling such a beautiful fragrance from its balmy herbs. Innumerable lizards run from bush to bush, glittering in their gaudy colours, and now and then the cheerful chirp of a bird is heard, who, happy to see living beings about him in the Desert, jumps about between the camel's legs, and sometimes perches on his hump and head, and even suffers himself to be caught by the men. On my journeys here I usually walk the whole of the morning, and do not mount before about noon. An inexperienced rider of the camel would be obliged to make the animal kneel in order to get up, but I have from the very commencement taught myself to climb up by getting hold of its long neck as the Beduin child, or to get into the saddle by one jump. This has always gained me the name of Bedawi.

The first hours after dinner are the most uncomfortable; even in this season the heat was here, in the shade, 28° to 30° Centigrade. But fortunately one is perfectly free in the Desert: I threw my shirt off to the middle of the waist, and bared my legs to the middle of the thigh, and thus let the cooling wind blow on my body. By this I also attained another object, that of burning my skin, which, during my sojourn of eight months in Egypt, had got white; and a white skin is not liked by the Beduin, and always suspected. During these hours one longs for the setting of the sun, and the night's rest; and in the scorching sun of the afternoon one enjoys in anticipation the coolness of the night. And when, later during the night, you get more than you want of cold, you again long for the hot sun of the day time. As you in the North long in summer for winter, and in winter for summer, so you here long during the day for the night, and during the night for the day. So the Beduin's plans and hopes are only from to-day till to-morrow.

While we build our castles in the air, and plan our schemes from year to year, nay from decennium to decennium, the Beduin only builds from sunrise to sunset. He lies down to rest at night as a rich man, with hundreds of camels and other property, and a host of children, his greatest treasure; and in the night comes the mountain torrent, he does not know whence, and sweeps away his tent and furniture, drowns his children, and in the morning he awakens naked and empty-handed as he came into the world, kisses his hand, and brings it up to his forehead, and cries, "Praised be the Lord." Or an enemy whom he does not know, and who only is his enemy because he happens to belong to some tribe of which, perhaps a century ago, a member has been killed in some private quarrel by one of his tribe, or for some still more indifferent cause, comes to take away his property. It is true, he may by some chance become richer than ever, but there is no security for it; and where there is no security, one only seeks the momentary enjoyment—takes the kopek to-day, and loses the silver ruble to-morrow. And in the cities it is still worse. If you possess more than sufficient to satisfy your hunger, and slake your thirst, and hide your nakedness, the Sultan, appointed by the Lord master of all the nations of the world, will deliver you from your superfluities. But the Lord gave him his power, and the people will pray, "*Allah yanser asultân*," i. e., "the Lord help the Sultan." But all reflections put aside. We had gone through the first twenty-four hours of our journey in the Desert. In the morning we passed the Springs of Moses, and filled from their waters our empty water-sacks. It is said that it was here Moses entered upon the coast of Arabia, after having crossed the Red Sea with his people. It is true that it is here only that the mountain range, which on the African side runs along the coast in a continued high ridge, opens in a small gap; and it is likely enough that Moses, on his flight from Pharaoh, did here come to the sea; but it is now deep, and without any kinds of banks and rocks; and at present at least I do not see how the sea could be forded. Higher up towards Suez, I remember having seen, while going in a wherry from the vessel that took me from Gidda to Suez, the sea full of shoals and sand-banks, and it may perhaps be possible even in our days to ford it. Yet Moses' Springs occupied me more than these thoughts of old, as well as five newly-planted gardens, which, by their bright green, strongly contrasted with the otherwise here cheerless Desert. They were laid out about five years ago by some Christian inhabitants of Suez. The Mussulmen plant no gardens, but live in hopes of the gardens of Paradise. This whole tract is full of shells and other strange productions of the sea, and the road runs along the shores of the Red Sea, in a sandy valley, between that and high mountain ridges to the east. For the night we encamped in the valley Sadr; of which goes the tradition by the Teyâha Beduins, that three men and three women, with an ass, lost their way while seeking for water, when they, with Beni-Hilâl, went from their native country, Nejd, to these tracts. All Beduins lay claim to a descent from Beni-Hilâl; and those who cannot prove their descent from him and these persons, as is the case, for instance, with Hoeitât, are despised as Fellâhs by origin. The farther we proceeded to the S. the more the road diverged from the coast, and already, on the third day from Suez, we entered the mountain passes, which separated us from the sea. On the 14th the road turned, by the valley Shebeika, somewhat to the E., and we were now among deep, mighty mountain valleys of granite. On the evening of the 14th we came to the home of my Beduin. Here his three little boys ran to meet us, and hung themselves round their father's neck. One of them, who could hardly walk, was lifted up on the camel and allowed to ride, not a little proud at this, to the tents, which, to the amount of about fifteen, were pitched without attention to any order or rule. It is a strange light that gleams in the little sallow Beduin children's eyes, the like of which I am not aware of having seen anywhere else. They

are like black coals in the middle of which lies fire. Nor have I anywhere but in the Desert seen such love and tenderness as that with which the father greets his children, and is received by them. They throw themselves round his neck, play with his beard; kisses and smiling glances are exchanged, and every one is happy.

I was taken into the first tent, which belonged to the brother of my Beduin, who had stayed behind us in Cairo. Here now assembled by degrees the few men who were left at home in the tents, and bid me welcome. I was now thoroughly acquainted with their customs and compliments, and behaved with all the courtesy of a Beduin—that is to say, rose at every fresh arrival, saluted, and kissed three cross-kisses on his shoulders, and repeated incessantly *Salamât* and *ala waḥḥyeh*, i. e., salutations and assurances of friendship. Therefore I heard my praise whispered half aloud: He is a man, he is a Beduin, he loves Arabia. But the eulogies attained their highest point when I took out of my coffee-bag a large handful of coffee and put in the roasting-pan, not allowing my host to fulfil this the first duty in receiving a stranger in the Desert. If I besides this had had sufficient tobacco to fill everybody's purse, I should have been considered the first man of the Desert; but in order at once to cut short their expectations on this point, I told them directly that I did not smoke. During the preparation of the coffee the conversation, as usual, was very lively, and ran on the accustomed topics. I felt exceedingly happy at being once more in a Beduin tent, which for so long a time I had not entered, and among the excellent inhabitants of the Desert. Meanwhile my host killed a kid in honour of me, and to bid me welcome. He was one of the poorer Beduins, and his herd consisted at the highest of five or six sheep; but he knew that I had travelled in Negd, and was well aware of the customs of the Beduins, so that he could not, without great disgrace, avoid killing one on my account. However, in doing this he made a great sacrifice. He soon appeared with some pieces of the delicious young meat in a wooden platter, and placed it before me. I, of course, invited all the bystanders to share my scanty supper, but courtesy prevented them accepting it. On the contrary, about twelve persons, men and children, watched with eager eyes attentively every morsel I took. This plagued me so much that I hardly ate one-fourth of the proffered portion, although the whole of it would scarcely have sufficed to satisfy my appetite. What I now left, notwithstanding my host's kind invitations to eat, I returned to my host, and he distributed it to the rest of the company. They consumed all, meat and sinews, so that hardly anything at all was left on the bones to throw to the dogs that were waiting about. Then the coffee-making began afresh, for which I supplied berries, and midnight had come before we had finished the last pan.

A stranger needs in the Desert only to be liberal with two articles, coffee and tobacco, to gain the name of *karim*, i. e. liberal—the highest praise a man can attain in the Desert. He is highly mistaken who wastes money on the Beduin. The coin has here in general but little value, for gold does not satisfy hunger, and here are neither market-places nor shops. The Beduin will certainly take your gold with avidity, especially if it be a sum of some amount; but when you turn your back will laugh at you, and only long for more, and will never bestow a word of praise on you for it. But if you do not put a morsel from your wallet into your mouth without sharing it with your travelling companion, if you pour Mocha coffee in the roasting-pan all day long, and if your tobacco-pouch is open to every smoker—if you besides provide clothes and calico for the hire of the camels on the whole journey from place to place, then you may travel safe in the Desert, beloved and honoured by all its people.

The night I spent alone in the tent—not alone, however, as goats and sheep and kids jumped about, and at last lay down on my bed all round me, yielding a very agreeable warmth during the cold night. The following day I spent with these Beduins, called Aulād Sa'id. Here one was occupied in cutting out and sewing the coarse calico which my Beduin had brought home for shirts for his children. This is very simple. The calico, which is sufficiently wide, is laid double and the length measured on the child; on both sides are made two incisions with a knife (scissors one has not) for sleeves, and above is cut a round hole for the head. Later the sides are joined with a coarse darning-needle and twine, and the shirt is put on amidst the congratulations of all present. The child twists and turns on all sides, not a little proud of his new garment, and all day long is congratulated by everybody. As for the rest, I have rarely seen poorer people than these Beduins, at least at that time. They said that they had had no hail, *i. e.*, rain, during seven years; and what they, their families, and camels ate they had to buy from Cairo. Most of the men, except lads and invalid old men, spend the greater part of the year in Cairo, or rather on the road between Cairo and Suez, carrying goods between these places. With the freight-money they buy beans for their camels and Indian corn for their families, who live in the Desert, and to whom they bring their provisions every second or third month. Here they generally stay one or two days to burn the camel dung to coals, which they in Cairo sell for about forty or fifty piasters. At the present time they possessed nothing but bread and a few dates—no butter, no milk, nothing at all but bread. I therefore lived on my own wallet, however disgraceful the Beduins thought this was to them. But as they always were allowed to share my meal of rice, this silenced them.

The following day, the 18th of December, when we had rested, we set out in the morning on our way to the Convent. Almost the whole way from Suez we had gone up hill; and when we had travelled for ten hours, and were about three hours' journey from the Convent, we came on a steep mountain path, which, although partly made, and yearly repaired, certainly no animal but the camel could ascend. Mighty, overwhelming granite rocks rose on all sides, and in the cleft between them ran a narrow valley, forming the bed of a river, which during rainy and snowy years rises in the mountains, and here descending flows through other little valleys, where it is joined by other rivulets, and seeks an outlet in the Red Sea. At this time it was, as well as the whole country, perfectly dry. Farther on we arrived on the plain *Arrāba*, at the end of which the Convent is situated, among mountains reaching to the clouds. Here we had a view of the different gardens belonging to the Convent, with pomegranate and orange-trees, &c. We passed the place where Aaron's house stood, and about an hour before sunset we arrived at the high Convent wall. The Beduin had, during the march of the whole day, entertained me with talk about the Convent and its inhabitants—praised their hospitality towards strangers and guests; but now, he added, "You are a Mussulman, and the Christians are sworn enemies of Islam; may the Lord, who governs the hearts, inspire them with benevolence towards you!" He, as well as all the other Beduins in the village from which we came, repeated continually the request that I should ascend the Mountain of Moses, and there, with a devoted heart, pray the Lord to send rain to the arid country and the starving people. Moses Mountain is the mountain of prayer, and the Lord hears the prayer of those whose heart is "white." He further told me how the monks of the Convent possess "the book of ruin," and how they, with their crosses erected on all the hills, prevent the rain from falling. I tried to convince him of the falseness of his views, and how unlikely it was that the Lord should lay such power in the hands of human beings, and how the monks as

well as the Beduins want rain for their gardens; but he was not to be convinced: "The Christians do not want rain, and the monks contrive to dispel the clouds from the sky."

The main gate of the Convent is placed at about three men's height up in the wall, under the roof. From this place several monks' heads peeped at us, and bid us good evening, inquiring whence I came. I answered that I came from Cairo, and later from Suez, and had a letter for the directors of the Convent; then a rope, with a large iron hook, was lowered down, by which I fastened the letter I had brought from Suez. When it had reached them, I heard the monk say, in an annoyed tone, "It is in Arabic." The monk's head disappeared from the peep-hole, and I sat down on a great stone, waiting the result, as uneasy as I ever at home have been waiting for the result of any examination. Yet I was not left to myself. A great crowd of Arabs were here encamped around us, and, upon having learned from my Beduin what kind of a man I was, they brought to me a host of children, turned up their shirt-sleeves, and begged me to look at their marks of vaccination, whether they were safe from the contagion of the smallpox or not. During this examination the monks reappeared at the peep-hole, and, while murmuring in their beards, let down another thicker and stronger rope, in which they begged the Beduins to tie my luggage. When that had been hoisted up, a third, consisting of four ropes, was let down, in which I was placed, and thus hoisted up, while my feet leaned against the wall. When I had reached a kind of thatched court-yard I was saluted by several monks, one of whom, an elderly man with a long white beard—the steward, as I later learned—addressed me in broken Arabic, inquiring why I had not a letter from Cairo, and assured me that he only for my sake, for this once, deviated from the rule, not to receive any one coming thence without an official letter. As it seemed to be as difficult to him to speak Arabic as it was to me to understand his broken language, he requested, in his native Greek, a monk that passed by to take a seat by me on the sofa, where meanwhile I had been offered a seat among some worthy greybeards, and ask me in Russian about my country and other relations. The man obeyed him, came to me with a Russian salutation, and asked me from what country I came. He was a Bulgarian by birth, had traded at Odessa and Taganrog, dwelt long in other parts of Russia, and had the Russian language entirely in his power. I informed him that I was from the Grand Duchy of Finland, and thus a Russian subject; that my country was quite close to St. Petersburg, but that my mother-tongue, properly speaking, was Persian! that I for a long time had dwelt in Egypt, and now intended to make an excursion to Moses Mountain. The monk seemed satisfied with my answers, translated them into Greek to the others, and bid me welcome for to-day, or for a year, or for my whole life, if I chose; said that the Convent, with whatever it possessed, was at my disposal, and other such Oriental expressions of courtesy. The steward, now apparently satisfied, left me to a young monk, with an order to take me to the refectory, and give me, as is customary here for welcome, some soup, a cup of coffee, and supper. I was led by the young monk Iskender, and followed by the Bulgarian, the chancellor of the Convent, to an apartment furnished in the Eastern style, with mats and carpets spread on the floor, and here treated according to the steward's orders. I was hungry, almost benumbed with cold, and therefore did not disdain a draught, offered me in a small cup, of very excellent brandy made of dates, although I hardly can remember any other case on my Eastern travels that this beverage has wetted my lips. The Bulgarian entertained me with Russian conversation the whole evening. After he had left us, Iskender (whose office was to have the inspection of the housekeeping, and especially of the cooking and all strange guests) entertained me in broken Arabic. Soon appeared at the tea-time a half-crazy Greek from

Athens, who, after having gone through his studies in Paris and Vienna, went to Leghorn, and there foolishly fell in love with a great Italian lady. His rich father in Athens discarded his crazy son, and sent him to the monks of the convent of Sinai. He spoke French fluently, and broken German and English, and was, with all his folly, perhaps the wisest of them all here. He knew the old Greek literature, and recited verses from Homer, which in his mouth sounded far more melodious than I ever heard them sound from our rostrum. But he plagued me with entreaties to give him lessons in Arabic, in which language he had learnt by heart several of David's Psalms from the Arabic translation of the Bible. These he recited to me very pathetically, but in so broken a language that I could not understand a single word. This reminded me of how I once recited the first verses of the *Odyssey* to some Kretio-Greeks, which they declared to be Russian.

The next day I made an excursion round the Convent, whose buildings, surrounded by a high wall, resemble a maze, with long, dark, and narrow passages and cells, and chapels and churches, and kitchens and storerooms. The main church is a nice Greek church, behind whose altar there is a small chapel on the place where Moses discovered the burning bush. Here lamps are always burning, and outside by the window stands a large beautiful cypress-tree. I proceeded farther on, through the crypt, where the skeletons of the dead lie heaped up, the skulls in one pile, the ribs in another, and all the different parts in special piles. The bodies are first buried, and, years after, the bones are taken and added to those of their brethren, in order to increase the collection. I went farther about in their numerous gardens, where magnificent fruit-trees of all sorts are to be found.

It was not until the 22nd of December that I found an opportunity to ascend the mountain. Accompanied by a monk, and three Arab lads who carried our refreshments in a leather wallet, I passed through a garden-gate, for the first time after my arrival, outside the Convent-wall. The road began almost instantly to ascend, and thus became toilsome and fatiguing, so that after twenty minutes I was glad to be allowed to stop by a spring, which a monk in former times is said, by his impressive prayers, to have moved the Lord to let flow here with the sweetest and purest water. After twenty minutes more we came to a higher mountain-plateau, in the middle of which stands a beautiful large cypress, and at one side a chapel dedicated to the Virgin *Mother of God*. There was now no resting-place, until about half an hour after we reached the top of the mountain. In vain would I endeavour to give you an idea of the view that here lay extended beneath my feet. As in the Desert of Negd I thought to see an ocean changed into billows of sand, so did I here fancy I beheld an ocean metamorphosed into billows of mountains. Everywhere rock, and nothing but arid mountains that extended in shorter or longer ridges on all sides, and, farthest to the E., only a slight streak of the Gulf of Akabá. The sky was partly covered with clouds, which now and then eclipsing the sun threw strange shades across the landscape. I sometimes fancied that the mountain billows rose with foaming ridges, and again sank into the darkness of the abyss; and I stood silent, thinking of that day when the mountain shook and trembled at the omnipotence of the Lord, and of the man who stood here. It was severely cold up here. The preceding night a slight rain had fallen, the first during eighteen months, according to the people's assurances, and on the mountain the water had frozen to ice. I had got my feet wet, and the cold wind on the mountain had quite stiffened my limbs, so that I, partly from the fatiguing ascent, partly through cold, felt rheumatic pains in the calves of my legs for weeks afterwards. We did not stay more than half an hour, when we again began descending through another road, which was far more difficult and dangerous. The former road was partly made and repaired by pious pilgrims, and consisted, as a monk told

me, of 3500 steps, besides that part where no steps were required. On our descent we reached the place where Moses sat and looked at the combat between the Amalekites and his people in the valley of Resphidim; and, farther on, the footsteps of the Arabian Prophet's camel, when he from hence, on his beast, made a spring into the seventh heaven. Below in the valley I saw the stone which yielded water to Moses's wand, but the spring has now disappeared; and, farther on, the stone in which the ungrateful people moulded the golden calf.

Towards evening we returned to the Convent. The St. Catherine Mountain, which is said to be still higher, I did not ascend. I spent my Christmas holidays in quietude in the Convent, in company with its monks, and found several of them excellent, if not accomplished and learned men. As they took me to be a Dervish, they did not consider it worth while to be very reserved, as is said to be always the case with the Franks, who are not willingly allowed to enter the Convent. They chatted with me as with one of their equals, and generally ten or twelve were sitting in my apartment. They all appeared to be contented with their lot, though not wholly able to withdraw their thoughts from the world. They spoke of "how the Devil tempts us in cities and in the world, and even here on this mountain he does not leave us in peace. He comes, and whispers, 'Why have you left the world? why have you not married, as others do?' &c. &c." This latter point seems especially to be the worm that gnaws their hearts, and it is worth observing that I made several confess that love in their youth had been the first cause of their turning monks. I was likewise particularly astonished at hearing several of them utter their dislike of the Franks, whom they depreciated. They said—and that was not meant as a compliment to me—that the Mussulmen generally were far superior to the Franks, who thought of nothing but eating and drinking and other mundane objects, while the Mussulmen serve the Lord with prayers and fast. Thus the whole religion of the Eastern people—even of the Christians in the East—consists entirely in outward ceremonies. Here, as well among Mahometans as Christians, he is most considered who most frequently tells his beads and most diligently murmurs his prayers, were he, in other respects, ever so great a rascal. Among the monks were two genuine Russians from the neighbourhood of St. Petersburg, and several among them spoke Russ, so that I regained some fluency in it. Upon the whole, they treated me with courteous benevolence, and I found myself pretty comfortable among them. They live by no means so frugally as one might suppose. Every day during my sojourn here we had fish, sent from Al Tur, and turtle from the Gulf of Akabá. As for the rest, rice and olives, butter and oil, brandy and wine, &c. Meat only is not allowed within the walls of the Convent. They have a rich monthly allowance of brandy, and it sometimes occurs that they in their affliction take a little too much. They wait upon themselves, bake their bread, and perform other duties in common, eat all together as brothers, one not better than the other, as they say themselves; but I often saw the gate-keeper monk, when he delivered the keys, fall on his knees before the Prior. The coarser work, such as carrying water and such like, is performed by Arabs, called Algebelyeh, half Beduins, half Felláhs, who, I believe, by turns perform duty for three days and then are allowed to return to their home in the tents on the mountain. They receive their main support from the Convent, but yet possess a few sheep. They are, in general, a low set, and speak bad Arabic, mixed with Greek words, which they have caught from the monks, and with coarse Arabic phrases, of which the monks make use in addressing them.

I found the library of the Convent full of fearfully dusty volumes. The Arabic manuscripts which I saw consisted, without exception, of translations of different books, mostly of the New Testament. Most of them were

defective, and I cannot even remember a single one that attracted my attention, although I did not forget the request of Professor Blomquist to examine well old monastic libraries.

I had now spent more than one week here, and, although I suffered no want, I cannot deny that the monastic life grew monotonous. I could not without trouble venture outside the walls, and the society of the monks became, in the long run, disagreeable. Besides, they spoke such broken Arabic that it tired my ears. With exception of the three hours they devote to divine service—in the morning at about eight, in the afternoon at four, and at midnight—several of them generally sat with me, and detained me from doing anything by myself. I suffered also from cold. The high mountains do not allow the rays of the sun to shine on the cloister except at noon; and, although I put on all the clothes I had with me, I was always cold, except at night, when I could wrap myself up in the blankets. My room opened into a corridor towards the E., where there are about twelve spare rooms, of which three or four are newly arranged for Franks, the visits of whom increase every year. The sun only peeped in for a short time in the day, and then so feeble that it could hardly warm me. I longed, at length, for the free open desert and its unaffected sons, and begged the monks to procure me a camel to Akabá. One dissuaded me from this way; it was unsafe, long, and dangerous, especially for me, being alone. But I was obstinate; I would go to Wadi Musa, and see this renowned mountain-city. The result was as follows. I was provided from the monastery with olives, cheese, flour, and coffee, with great liberality. They had become friendly towards me, notwithstanding my first cold reception. I could not, therefore, Dervish though I be, leave without a small gratuity to several of the monks and a small gift to the Convent, and, with the greatest economy, I did not escape with less than about 140 piasters.

On Sunday the 27th of December, a Muzeini Arab took me from the Convent to his home in the desert. These Arabs live along the eastern coast of the peninsula towards Al Tur and around the Convent, are in general more wealthy than other wandering tribes in the vicinity, and reckon their descent from the Arab tribe Harb between Al-Medina and Mekka. On their present place of encampment they had no tent, as they, on account of the scarcity of grass, are obliged nearly every day to change their place of abode. They were encamped among low bushes in a little valley in the chalk mountains. The following day they moved to a valley under the mountain of Alkomrah.

On the 29th of December I left these Arabs, accompanied not by the man who had fetched me from the Convent, but by a young Beduin of about eighteen years of age, of this tribe. We first crossed chalk mountains, and, afterwards, large steep granite mountains, before we reached the deep valley of Serrah, and, later in the evening, the valley Marrah, which again lies among calcareous mountains. The character and appearance of these mountains is quite different from that of the granite ones; they run in beautiful valleys resembling saloons and apartments, with narrow corridors between them, and their ridges form flat roofs, as all houses have in the East, generally with a cupola at one end or in the centre, as on the houses in Jerusalem and Hebron, and the mosques in Egypt. I often here met with Hebrew and Greek inscriptions on stones and in mountain-walls; but as my Beduin assured me that the Franks who travel here always copy them, I thought that I might pass them. The following day we entered the valley Gazaleh, a deep valley among granite mountains reaching to the clouds. The ridges of these mountains resemble the roofs of Gothic churches. Hardly any roads exist, either on the former or the latter, and they are stern and gloomy. I thought myself here at the bottom of a river-bed, but seemed unable to decide of what the billows of the river consisted, whether of water or fire. The latter element seemed more

likely to have flowed in the mighty river-bed, for its mountain-banks were twisted in the most surprising forms and blocks, some fiery-red, some brimstone-coloured, some ashy-grey,—and these blocks were strewn about in the most awful disorder. Some had rolled down to the bottom, others had been stopped in their downward course, while others again hung on a point, all ready to fall at the least touch. We passed several single nomadic Beduin families, separated on account of the scarcity of grass, and encamped for the night in this valley, under a high mountain; and we were just going to cook our coffee, when a stranger appeared, approached us, and bid us good evening. He had a very robber-like appearance, shabby and starved as he was; but I soon discerned, from his humble words and behaviour, that he came, like a fawning dog, to get a morsel of our supper. This he indeed obtained at once on the assurance that he and his mother, a woman of sixty, had not for weeks tasted bread, but lived exclusively on the milk of their goats, and that they the day before yesterday had been obliged to kill a kid. He was so excessively polite; he called me a *sheikh* and *effendi* and *khawage*; repeated almost incessantly at every third word the friendly expression *Wajatek inta*; called him (the Beduin) nephew and cousin, and would not allow him to perform any of his duties—he would perform them for him. But then he also relished our rice and our coffee. I can hardly remember to have shared my meal with any one with so much pleasure as with this Beduin, although I cannot say that his mean humility pleased me, as I was not accustomed to see such conduct in the Desert. When our meal was at an end, and my little saucepan licked clean by our guest, he asked me if I would not give him some bread in exchange for a kid, and, as I assented, he repaired home to fetch the animal. Now, my Beduin informed me that he knew the man, that he was a good-for-nothing, and that his uncle had once killed (*katal*) him, when he on a journey had tried to steal flour from his wallet; that he was not a Muzeni Beduin, but of the tribe Macaze, though born and bred among the former. The first of this information that surprised me was that the man had been killed and was still alive; but I had hitherto not heard *katal* employed for *murder*, which I have later often heard; and indeed a deserved blow for a mean action is death to the Beduin. The next idea that entered my head was that the man perhaps might intend to rob us during the night, but I despised him too much to fear him. Meanwhile he soon returned with a kid about a month old, for which I gave him in exchange 15 handfuls of flour and a little dry bread, which I had in store from the Convent. Though we were satisfied, from the supper we had just taken, we killed and cooked our kid, for in the Desert one never keeps anything for the next day, except water, for the want of which one always and in all cases has a particular fear. Besides, one is never so full here that one cannot with ease begin another meal after having finished the former. The young meat roasted, with the excellent butter of the Desert, eaten with onions, pepper, and salad of haaf—a vegetable that the Desert produces, and whose large, pear-like pod contains a thick dough—with savoury corn, formed a supper that might be envied by a glutton. After this I made some tea, and ended, by the full moon of midnight, one of the most delicious evenings I have spent in the Desert.

The following day we passed through Wadi Pein, which forms the continuation of the valley of Ghazale, and possesses an excellent spring, to the Sea of Akabá. It is remarkable enough that I, an islander, born and bred by the sea, and always attached with devotion to that element, never here in the Desert have felt a longing or a predilection for it. It appears as if the Desert here replaces the sea. The sea-fog often disagrees with the camel, and makes it swell up and die, for which reason the Beduins, on their arrival at Suag, wash its nostrils with sea-water, as a preservative. The Beduin himself does not like the sea. He says that its waters are neither good to drink, nor do

they produce vegetation. I remember, when I returned from St. Petersburg to the Gulf of Finland, how I rejoiced at its blue surface, and the delight with which I at Marseille greeted the Mediterranean. But here, when after more than one year's sojourn in Egypt, where I had only seen the muddy waters of the Nile, and after almost as long a time spent in travels in Arabia, where only wells and springs are seen, I came at Gidda to the Red Sea, I felt but little pleasure at its bright appearance. So it happened also now, when I emerged from the mighty valleys on to the sea. As our young camel, unaccustomed to toilsome journeys, was somewhat tired, and it besides was New-Year's Eve, I willingly assented to my Beduin's desire of encamping shortly after noon, among low bushes near the sea-shore. I took a bath in the Golden Sea, across which Solomon is said to have carried the treasures of India to Jerusalem. The water was as warm as in the hottest time of summer it is with us, and during the fortnight that I stayed by this sea I bathed daily, thus hardening my body against future cold.

Our course from here lay uninterrupted along the sea-shore, covered everywhere with mother of pearl, shells, snails, and other of the wonderful productions of the sea. Animals of the strangest shapes were washed up by the waves, and cast up on the sands. I amused myself by catching them, and regarding their comic shapes. We generally met Beduin fishermen, who, for a little bread, gave us the most delicious fish, but no boat or vessel seemed to exist here. First in Akabá did I see the fisherman tie the three palm-sticks together, and in this vessel repair to sea. Here are several palm-plantations, belonging to different Beduin tribes, and watered by springs and wells, of which there, in general, is a good store. Meanwhile my Beduin had begun to speak of the insecurity of the road in the neighbourhood of Akabá; and even his relative, who was encamped here in a palm-grove, Noweiba, and on New-Year's Day treated us with fish, begged us to be on our guard higher up in the country. He informed us that an inhabitant of Akabá, returning from Suez, had left his vessel on the southern coast of the peninsula, and passed by here the day before yesterday in company with a deaf Muzeini Beduin. I never remember to have heard in Arabia of people with this defect; but of the Muzeini tribe, my Beduin said, there were three such; among whom one was deaf and dumb, who had preceded us on our way, and two deaf, who were, however, capable of speaking. People whom we met, later on our way, gave us the same advice to be on our guard. Certainly nothing had yet occurred; but in Akabá people of all tribes assembled, and prudence and watchfulness were always useful. Such talk is very common among the Arabs, and I paid little attention to it; but not being acquainted with matters here, and knowing that around cities and towns are always petty thieves and robbers roaming about, it made me somewhat uneasy.

We proceeded slowly on the 1st and 2nd of January, often so near the sea that it washed our feet. As I felt compassion for the young animal, I walked a great deal on foot; sometimes far on in advance of my guide, sometimes behind him. We had proceeded the 2nd of January till nearly afternoon, when I, who walked a good way before the camel, saw a well-dressed Beduin sitting under an acacia tree. In the Desert one never passes any one without saluting and inquiring about the road and the relations between the nearest tribes, and a conversation, though short, is always entered into. I therefore approached the man with the usual forms of compliments and salutations. The man arose and answered my greeting very ambiguously, with his eyes turned not on me but on my luggage, which now, meanwhile, had approached with my Beduin. He now asked me *Mau ha Hama*, i.e. Who is it? but so indistinctly that I three times had to make him repeat his question before I could understand him. The man appeared to me more suspicious than any I had met in the Desert, and the first thought that struck me was, that he had a

fancy to my luggage, and wanted to extract information whether his relations to the Beduin were such, that he, according to the ideas of the Desert, had a right to plunder me. But he was a single man, only armed with a stick, and I thought I could manage him. The second thought that entered my head, after I had dispelled my first fears, was of his difficult language, the like of which I nowhere had heard among Arabs; I already began to think of a new dialect. Meanwhile my Beduin had now approached, stood beside us and saluted the stranger with the usual compliments and kisses. Upon which the stranger, without any further introduction, began a narration in the wildest words or sounds shriller than the yell of the camel, accompanied by the most distorted gestures. I now understood whom I had to do with. It was one of the deaf about whom my Beduin had told me. There were in the man's gestures and sounds evident expressions indicating reports of fire-arms, sword-fights, battles, and flights, which by no means tended to appease our fears. However, as we were here in security, I was calm, and, when the man left off talking, said to my Beduin, "His words are many, but who can understand them?" Upon which my Beduin began to explain the meaning of his words thus: That the deaf man, who was present, had set out with a man from Akabá, and had almost reached his goal, when they met with robbers, who fired at them with guns; that the man from Akabá had fled on his camel, and the deaf man had escaped from the fight, had likewise fled and come hither in safety, and from here sent another deaf and dumb Beduin, who was settled here, to acquire information about his beast, and that he was now waiting for his return. Although I did not feel convinced of the truth of the avowment of the deaf man, I told him that we must wait for his return, and we then all three ascended the mountain and lay down under an acacia tree, offering the deaf man coffee and bread, as he said he had not tasted any food either yesterday or to-day. I now began to meditate on his statements, and found them improbable. The man from Akabá would as little have been able to escape the robber in the Desert as the deaf man; I now, refreshed by my coffee, began to lay my doubts of his veracity before my Beduin. He then undertook to question the deaf man more closely by signs and sounds, and after a long trial we extracted the following from his accounts. The man had been hired in his home by the man from Akabá, who had landed there, to bring him home; having made scarcely a day's journey from the outset, the Akabá man had declared that he would but travel at night, in order in the dark to avoid supposed highwaymen, who are found around all cities and towns; and as the deaf man was not well acquainted with this somewhat intricate road, which diverged from the sea-shore and wound in among the mountains, the Akabá man had persuaded him to rest here, and send with him and the beast the Muzeni man, who was encamped here, and who, being an old fisherman, was well acquainted with the country and all its windings. It was two days since they had left, and as the deaf and dumb man had not yet returned, the suspicious deaf one made all sorts of suppositions concerning his friend and the animal's delay, surmising that they had been attacked by robbers and plundered, and the beast yielded up to them. Thus it was all nothing but guess, and my Beduin wished me to continue the march; but I preferred certainty to uncertainty, and declared that I would not leave before I had seen the deaf and dumb man return. Nor had we to wait long before we saw two men arrive along the sea-shore, and by degrees approach us and our blazing fire. They soon stood before us and solved all doubts. One of them was the deaf and dumb man, the other a Hejwi Beduin, of which tribe several individuals now wandered about in this neighbourhood. The latter was a sensible man, and informed us, that there was no one on the road, that all was quiet and safe, but that the deaf and dumb, who was more of a fisherman than a Beduin, on his return from Akabá the first evening had cast his net into the sea, and while he was fishing

the deaf man's camel had escaped to the mountain, and that he had not been able later in the night to catch the animal. This was the cause of his delay, which the deaf man explained so alarmingly. Happy and calm in mind, I invited the whole company, consisting of four persons, to share my meal of boiled rice, which was now in readiness, and which disappeared within a few minutes. The deaf and dumb man gave us, for second course, some fish he had brought with him, and after they had been baked in the fire we eat them, full of coals and ashes as they were. But when the demands of nature were satisfied, questions were interchanged between the deaf and the deaf and dumb, about the lost camel of the former. The deaf and dumb was a quiet, peaceable, grey-bearded man, who could not bring forward a single word; he made himself understood merely by signs and a peculiar broken sound resembling our "tprro" to the horse, at which he snapped his fingers. Sometimes, however, when he found that he was not properly understood, he got irritated, and uttered frightful, heart-rending shrieks. The deaf one, on the contrary, was a hot-headed young man, with a wild exterior, and still wilder were his half-intelligible words. The Hejwi Beduin, a sensible man, of about forty, said of the old man that his heart was white, but the purposes of the deaf he called black. The deaf demanded that he should again procure his camel, having taken it away; to this all present replied that it was *shai min allah*, i. e. a misfortune, which could not be laid to the charge of the old man, and proposed that the Hejwi Beduin should go among the mountains to look for the escaped camel, and that the deaf man for this should pay him ten piasters. But you should have seen the deaf man when the question was about paying down money; his naturally sallow complexion changed into deep red, his eyes flashed with anger, and words flowed from his mouth that sounded like the rolling of a cartwheel, and he demanded that the deaf and dumb man, and not he, should pay this money. But he was alone against three, and he took the loss of his camel so much to heart, that there was no help for it, but to pay his ten piasters. After this we all, with exception of the deaf and dumb old man, resolved to set out for Akabá. The sun had set, but the most beautiful full-moon shone, and we put ourselves in motion. The road wound through the mountains, at some distance from the sea, and separated from it by ridges, which from the mountain go right down to the water. We performed that evening about four hours' march before we encamped.

The following day, the 3rd of January, we continued our march round the bay itself, and proceeded on till a few hours before sunset. Here the deaf man also soon found his camel, which had been taken care of by a Beduin who was settled here near the fort. I went with my packed beast and the cloak, which no camel-rider misses, into the large court-yard of the fortress and asked for its superintendent, for whom I had brought a letter from the Sinai Convent. I was told to apply to a small man, with small eyes, who was sitting amidst a great crowd of Beduins. With Salám salutation I sat down by them, delivered my letter to the man, and when later, its contents had been understood, I informed him, all the while scraping the ground with my stick after the Beduin fashion, that I purposed to proceed from hence through the Araba valley to Alkhalil (Hebron), and desired to know whether the road thither was safe and accessible, in which case he would render me a service by sending me to the renowned Hocitál Sheikh ben Hossein Ibn Gäd; if not, I would return with my Muzéini Beduin. When I had ended he said that the road was far from secure, that the Arabs were at war with each other, that they made prizes of each other's camels, and now and then also of camels belonging to the forts. "But here is the Sheikh Hossein himself," said he, pointing to a well-dressed Beduin among them, with small piercing eyes. At this moment there entered from the gate a proud, handsome Beduin sheikh, and as I in this man recognised my old friend and companion to Algawf, Mañan

Sheikh Ahmad Alkobbā, I rose with the words, Ahla wa sahla birifiki wa habibi Ahmad, i.e., God speed you, my travelling companion and friend Ahmad! Cordial kisses were now exchanged, and he sat down and talked about things in Algawf and Negd in a lively conversation, in which the others did not partake. After the effusion Hossein al Ahmad asked me if I was that man whom he the year before had brought with him to Algawf. When the latter affirmed that I was, he seemed to take more interest in me, and answered to my question how I now ought to proceed with regard to my journey. "You have travelled much among Arabs on dangerous roads, and the Lord has saved you; why should he not now lead you safely this short journey? Stay here a few days by my tent in the Desert, about two days' journey from hence, and I will there find a man for you, who, being neutral among the hostile tribes, will bring you whither you wish; and rely on the Lord, and write back to the Convent that you have reached this in safety, and confide yourself into my hands." I knew well that I could not rely too much on the man's promises, unless he was induced by good payment to fulfil them; but I also knew that I might return whenever I chose. I wrote a letter in great haste in pencil, and took the seat assigned to me in the great roofed gateway on a high sofa. The first thing I inquired about was the relations between the Beduins here, and I learnt that the two chief sheikhs in Hocitāl, Ibn Gād and Ibn Gāz, though cousins, were on ill terms, and plundered each other, though as yet no blood had been spilt. One of the chief causes of the feud was envy. Ibn Gāz envied his cousin for the great advantages he derived from the Franks in enriching himself, and all that he gained from the Pacha in Cairo, which Ibn Gāz wanted to share with Ibn Gād. Thus the Franks were now here the cause of great feuds, as they had been for about a decennium ago between two tribes of the Towara Beduins, Assawālbe and Almuzelui, among which tribes Frankish gold yet causes bloodshed. All Beduins in this neighbourhood were on the move on this account, as every one hoped to be able to make some booty. Several tribes, however, were neutral, among whom were likewise the here-dwelling "Aliwīn;" and one of their principal sheikhs was at present here in Akaba. This, a young man (who imitated the polite manners of a townsman, which principally consisted in repeating at every third word "*ya wādi*," an expression as common in the cities of the East as Monsieur is in Paris, and not *na'am*, a much admired expression in the cities, but hardly ever used by the Beduin), came and seated himself beside me in the evening, and assured me that no one but he should guide me; that he was neutral among the combatants, and that no one dared raise a hand against him. The usual compliments were freely exchanged between us, and we were the best friends, and the whole plan for the journey was laid out. We were to visit all Arabs and quarter with them, and we should see nothing but gaiety and merriment on the way. I knew too well that this was only the introduction to the payments-text, but I let him talk on as much as he pleased, and paid him in the same coin, until he at last in the slyest manner alluded to the chief point, upon which I shortly told him that I would not give him more than 100 piasters, a small sum in proportion to what the Franks in general are forced to pay, but sufficient according to the usual prices in the Desert. He had at least expected 200 piasters, and seeing that I was not to be taken in, and as the return of the Mekka pilgrims was expected in a few days, there was an end to our bargain as well as to our friendship and compliments. The following day Hossein set out with his whole caravan, promising me that he in at the most four days would send me a man to take me to his home, and farther on as occasion offered. Not four, but twelve days, was I kept waiting, when at length Hossein's son appeared, informing me that the road was impassable for want of security. These twelve days were not very

agreeable. The people here were the greatest wretches I have ever lived with, and, besides, all were afflicted with rheumatic complaints, which seem to be endemic here. Yet as long as Alkobbâ was here he was my constant companion, and cooked my food and my coffee; but when after about seven days he left me, I felt lonely. Fortunately I had, however, found a small house to hire outside the fort, as the two first nights I had passed very uncomfortably on my sofa in the gateway. Part of the garrison of the fort kept their night-watch there round a burning and smoking fire, and beguiled the long night with talk and low tales. I have always been a friend to the popular language, and preferred its powerful natural expressions to the polished and insipid language of the drawing-room; but these fellows' language was too burlesque and vulgar, and contrasted strongly to that which I now was accustomed to hear among the Beduins, whose conversation generally is distinguished by great decency and modesty, quite contrary to what we hear from the townsman, who, notwithstanding his pretended urbanity and eloquence in this respect, is far behind the inhabitant of the Desert. In my house I was left in comparative peace, only plagued with visits of patients, who bothered me to cup them and prepare eye-water, &c., a business that belonged to my alleged vocation of a medical man. Fortunately the temperature in this tract was very warm in comparison to that from which I came.

The Sea of Akabâ, and the whole of this part of the Araba valley, lies very low, and, as it seems to me, far below Suez. I bathed, as before mentioned, every day in the sea, and walked along the shore, regarding the strange shells and other marine products which the waves washed up in great numbers, and never suffered from cold.

As I now, after having waited so long, at length had got an answer from Sheikh Hossein, I adopted the plan, which I already earlier had laid out, to return to the fortress Nakhil along the pilgrims' road, and from thence proceed farther on past Gbazze to Hebron and Jerusalem. There were here at present the garrison soldiers of the fortress of Nakhil, who in a short time were to return thither. I hired a Hejwi Beduin with his camel for a small sum, and on Friday, the 15th of January, in the evening, we set out, three men and two camels, besides a negro slave, who went on foot to Nakhil to execute his master's errand, which was to fetch home one of his daughters, who was married in Nakhil to a man who most cruelly treated her. As an instance of family scenes that sometimes occur here between married couples, I may narrate, that her husband, according to the account of the women and men of Nakhil, one day took his wife, heaven knows for what fault, and tied her by the feet to the roof with her head hanging down, confiding the key of the apartment to his other wife. Thus she had hung for hours, until her shrieks at last induced the neighbours to inquire, when her *dorra*, i.e., the other wife, from fear and shame, delivered her from her troublesome, incommensurable position.

I have but little to say about our three days' journey to Nakhil: the country is high, and cold, and dewy, rising from the bay of Akabâ for about six hours' march; it is a steep, mountainous country, partly calcareous, partly granitic. My company was most agreeable, and, save the usual cold temperature, and one very disagreeable rainy night, I had no discomforts, and time slipped away pleasantly. On the way we passed two Arabic inscriptions cut into the calcareous mountains, from the time of Sultan Selim, who is said to have laid out this road for the pilgrims. I merely mention this, because they are almost the only Arabic or Mahomedan monuments I have met with.

The evening of the 18th we arrived at Nakhil, where I was rather surprised to find myself recognised from my last visit there, when I was on my way to Algawî. I was also bid welcome, and saluted with kisses, I believe, from the whole garrison. What further astonished me was, that, since I was here last, in hardly

two years, quite a small town had sprung up where before there was but a single house outside the wall of the fortress. The man who had been my travelling companion, and here possessed his own house, lodged me, but was not allowed by his comrades to prepare us any supper. A lively contest arose about who should have the honour of entertaining us, and it could only be settled by drawing lots. The following day I found a house for myself, where I spent nearly five days alone.

Meanwhile the vanguard of the pilgrims' caravan arrived, consisting of Maghrebins, who always are the first pilgrims that return. They came in four separate divisions, all on one day, amounting at most to the number of 2000. They related that the cholera raged in Mekka and Al-Medina, and in general among the pilgrims, of whom thousands died, and that the great Egyptian caravan on its return had to keep the quarantine in Akabá. Having nothing to do here, and as time was heavy on my hands, and I was lonely and cold, I found out one of the Tiyaba Beduin sheikhs, called Nassâr, and agreed with him to take me on to Hebron. In fact, I had not sought him, but he laid hold of me. He came, accompanied by one of the garrison, to me one afternoon, and after the first salutations were performed, he threw himself, with that indifference or nonchalance peculiar to the Beduin, on my mat, and without any further introduction stretched out his hand to me to let me feel his pulse. This is very common here, and they believe that the physician, without any further examination and questions, merely from the pulse, ought to know the disease of the patient. I put on my medical air, laid three of my fingers on his pulse, and fixed my eyes on his countenance. I felt beneath my fingers a strong manly pulse, which beat in a bony, powerful arm, and could find nothing but a strongly-built, healthy young man, of some thirty years, and I should tell a falsehood if I said that I could make out his disease; but his half-embarrassed behaviour and sly laugh, by which he bent himself backward (*istalgâ* 'alae gafah), led me to presume in him the disorder so common here; and when I thought my conjecture right, I said: "Aha, my man, it is that which ails you, is it?" A slight, hardly perceptible blush on the cheeks of the Beduin convinced me that I had guessed right; and I succeeded so well, that the man began to drop the subject, alleging business abroad, after the performance of which he would instantly return. He went, and soon after returned alone; and now, when no third person was present, he began to talk. The travelling conditions were settled, and Nassâr promised to send me from his tent a camel to bring me thither, while he himself was obliged meanwhile to repair to a meeting of Beduins, in order to settle some quarrels between the tribes. This promise was fulfilled on the 23rd of January, when his own wife, a handsome, smart Beduin woman, brought me a camel, and begged me to follow her to her and her husband's home in the Desert. Dispensing with all leave-taking visits, and without bidding any one good-bye, I set out on the camel, guided by the Beduin woman. We had scarcely proceeded two hours when we reached the Arabs,—thus the Beduins always call themselves. They had here only their small temporary tents; the large tents they had left in their proper home in the Desert Al'ed-mesor Edom, hanging up in ropes; for the Beduins never rob each other's tents except in open warfare. I spent two days here alone with two women—one of them my hostess, the other Nassâr's uncle's wife,—and my host's little son, an unruly boy of five years, who, though he was the most kind-hearted fellow, and dearly beloved by his mother, who had no other child than him, and one she bore beneath her heart, always in real boyish manner showed himself disobedient to her, and did not mind her threats to cut off his nose and throw it in the fire. I should fill more than such a letter to describe and repeat all the strange words and scenes I here witnessed between mother and son, who, just as they were crying and fighting, flew into each other's arms

with kisses and embraces. Later, when his father came home, and she complained of his disobedience and incapacity, the man laughed, and was not a little proud of his boy, who would not obey women, but was always willing to obey him. And, in fact, the Beduin boys are very obedient to the father, and likewise to the mother when they are left alone with her, and no one sees them. I may say that I nowhere have seen more obedient and better children than in the Desert, and in the cities too. It is true they are often very refractory to those who do not understand them, but he who manages them properly can make them obey by the first hint. They are as the camels and horses of the Desert,—one neither makes use of bridle nor halter, and yet makes them go as one pleases.

Nassâr had now returned with the account that he could not accompany me himself on my journey; he feared that the pilgrims' caravan should arrive in those days, and it was impossible for him in such a case to be absent; he had brought with him another man, who should follow me; but as this man, according to his language and appearance half Beduin and half Fellâh, did not please me, I instantly declared that I would not go with him, and with no one but Nassâr, with whom I had made the first agreement about the journey. Now a long discussion began. Nassâr would send his uncle with his own camels; but I would by no means yield. The uncle was a middle-aged man of about forty, and did not either please me much; but on the contrary, Nassâr appeared to take my fancy particularly, and we went to rest without having taken any resolution, or settled anything. I comprehended that Nassâr could not follow me himself, and I resolved inwardly to accept of the uncle instead. The following morning the question was renewed over the coffee, and this day was fixed on for my departure; but as I was in high spirits and had taken a resolution, I felt inclined to tease the Arabs a little, and after the conversation for a long time had turned on different topics, I exclaimed, "O heif kum, O heif kum," &c. "For shame, Arabs! for shame! do you think yourselves dogs, that I should not have seen and lived with Arabs before this? No: by the house in which we sit; by the fire which warms us; and by Him who created the bean whose juice we drink,"—all oaths much used by the Beduins,—“I have travelled among Arabs, and lived in their houses, and found them to be men whose actions are in accordance with their words; but you are no Arabs, you are Fellâhs, and dogs are you; your words are as wind, and so are your actions. I have never yet met an Arab who entered into an agreement and afterwards broke it as you have done, Nassâr.” With a louder voice than usual, and somewhat irritated, Nassâr now cried out, “Yes, Arabs, I have agreed to bring this man to Drahrijeh (a small town near Helton), and got earnest-money from him; later circumstances have occurred which prevent me from leaving these parts; I have fetched him a good, well-known man to guide him in my stead, whom he has refused. Now, I offer him my own uncle, who is better than myself, to bring him on my own camel and my own saddle; he refuses to accept of him also; can I now do otherwise than take him back to the place from whence I have fetched him? Put the saddle on the camel, and take my coffee-pot in pledge for the earnest-money, and let us return to Nakhil.” I answered briefly, “Yes.” But now the others began to talk to me, and to represent that Nassâr's uncle was as good and trustworthy a man, and that I should not suffer any hardships on the journey; and I accordingly suffered myself to be persuaded. Nassâr now reminded me of the domestic troubles between him and his wife, and I got rid of him by writing a talisman, containing several of the Lord's ninety-nine names, and a few Hebrew letters and Swedish nonsense in Arabic characters. But I did not escape his wife so easily; she had observed that I wrote a talisman for her husband, and, when he absented himself, she assailed me with questions concerning the cause of this talisman. I

assured her that it was for her husband's weak eyes, but perhaps her conscience reproached her; she would not believe me; said she was no silly fool; she insisted that the talisman was on her account, and, with a toss of the head and flashing eyes, she begged me not to leave it in her husband's hands, which I, indeed, had not done yet. At last I was delivered from her troublesome examination by the camels, which were fetched and made to kneel before the tent. The Arabs were to move, and I set out. This was the 27th of January. Our track was the same for a while, but we soon parted, and Nassâr went one way and his uncle took me another; but Nassâr would not leave us before I left the talisman with him, by which he, fool that he was, thought to regain the heart of a capricious woman. I was thus now again alone in the Desert with my guide, who led the camel. The road lay across fine, smiling country with calcareous mountains, bereft of all bushes. But the grass had not yet sprung up after the last rain, and my Beduin said, "As a wound takes forty days to heal, so the herbs need forty days to spring up." Yet the first grass of spring began already to appear in the valleys, and here and there little green patches peeped forth in the Desert. But we soon entered Edom's awful desert, a dark extensive plain, strewn all over with slabs of calcareous stone, and without any sign of life. Yet even here appeared some spots more friendly, and small sheltered tracts of land, with a few shrubs, though withered, proved that, if the Lord would send rain, even here might be found life. The farther we proceeded the greener the land became, and the richer the valleys and plains. Such tracts and plains in the Desert where shrubs and herbs are found the Beduins call *rawd*, and they furnished food for our beast and provided us abundantly with fuel to warm us during the cold nights. We passed several Arab families and even considerable numbers of tents, but did not put up with any one. The 30th of January we came to the valley *Serdan*, where fine fields of wheat and oats were cultivated by the Beduins. Here the grass-patches increased and were adorned with the gaudiest flowers, among which I recognised many from my native country; here the buttercup and the daisy greeted me with the same beauty as in our meadows, and many others whose Arabic names it amused me to inquire from the Arabs and put down. Here we also passed the wells of Birein and indistinct traces of an old, probably Israelitic, town, A'weh, at some distance from the road. Distinct and extensive traces are everywhere apparent of the former wealth of Palestine, and, grieved at the decay of the land in the present time, I could not help being vexed with my Beduin, who, upon the whole, was sharp and cross, and said to him, "How comes it that all the parts where the Beduin comes now lie deserted and desolate? Where formerly on these hills were found the most beautiful gardens and vineyards, you find now nothing but desolation and stonchills." He answered—"The Arab lives in the Desert on his camel, and does not like cities." "Yes, that is true; but how is it then also that your life is not that of human beings, but of dogs? You suffer hunger all the year round; no clothes do you possess to protect you from the cold; therefore you are miserable men, and the shabby, dirty clothes in which you wrap your bodies are hardly sufficient to hide your nakedness." This he was obliged to acknowledge,—so much the more so as it was his own case. He had formerly possessed a great number of camels, but now he had not a single beast, and when he moved he had to put his house and other appurtenances on that of his nephew. The latter he had himself brought up from his early childhood, when his father died, and now he sent his uncle with me on a journey of six days, which he had to perform mostly on foot, and as recompense for the old man's trouble his nephew gave him about one-sixth of the hire, corresponding to $3\frac{1}{2}$ copper roubles.

The last of January we came to some Arabs, a division of the tribe Tiyāha, called Allukāt. I had made the agreement with Nassâr and his uncle that he

should take me to the town of Alsahirijeh—for to Hebron they could not go on account of the hostilities—or leave me with some Arab tribe, where I could practise as physician and thus gain some money. For I had thought of remaining for some weeks in the Desert if I could find a tribe of Arabs that I liked, and who were better off than the poor Tawaras, and most of the Tiyāha I had seen about Nakhil. My Beduin, whose heart I however had won, by sharing with him every morsel I ate, had the whole time praised these Arabs to me, and advised me, as they were wealthy, to stay with them: I should in a short time gain hundreds of piasters, and meanwhile have free meat and drink. We arrived here in the afternoon, were kindly received with coffee and dinner, which usually is served up here at about three o'clock, and they inquired about me of my Beduin. I passed as medical man and vaccinator, and intended to stay with them for some time. The, to me, disgusting examination of sick, at once began; but I declared in the reception-tent that I would undertake nothing before they placed me in another tent, where I might be left in peace by the people. One of the Beduins, who was present with a young son of his, who had an impediment in his walk which he hoped I should be able to cure, proposed to me to move to his tent, but inquired however first whether I demanded any fee before the cure was performed; but as I assured him that I would take no money before the patient, by the help of God, had recovered, he carried my luggage into his tent, and I followed him thither. My host was an excellent middle-aged man, although with a white beard, and his tent was roomy and rather clean. My first work was to make experiments on his young son, of about fifteen years of age, a smart, fine Beduin lad, who had been so unfortunate about two years before, after a severe cold, to get rheumatic pains in his thigh, which had ever since rendered walking so difficult, that he, for instance, could not overtake a camel when it went among the mountains, and always limped a little. By cupping and ointments I succeeded, during the few days that I spent there, in improving his walk in some degree, although he every day went in the valley with his camels. Notwithstanding my seeking refuge in this tent from the people, I did not, however, succeed in escaping them. Our tent soon became the meeting-place for the men of the village, and I was never left to myself for a moment. I had constantly to cup and bleed, make eye-water, distribute aperient medicines, apply caustics, and so on. The Perik, i. e. village of tents, was large, consisting of about fifty tents, and among the inmates were patients in abundance. At first I had resolved to stay for some weeks, in order to live thoroughly among Beduins, but at the end of the second night I found myself in a most disagreeable position; I felt as if on fire. Vermin, the inseparable companions of the Beduin, had crept on me, and I told my Beduin who had accompanied me from Nakhil, and was still here, that I intended directly to go to Alsahirijeh. The Beduins surrounded me, and begged me to stay with them: I should gain plenty of money; I had already become like one of their relations, and might command whomsoever I pleased to bring me milk, bread and butter, or what else I might wish. I said in excuse that I was not accustomed to their way of living, and that I longed to come to a city where I could have a house to myself. Besides, my Nakhil Beduin was afraid to go to Alsahirijeh, or any other of the different small towns before us, for we had here learned that a military force was about, collecting taxes for the Sultan, and all the Beduins were afraid of these men, who at pleasure assailed whomsoever they met on their way, and deprived them at will of so much of their property as they pleased. The affair in question was finally thus arranged: the man with whom I was, should, whenever I demanded it, take me to Alsahirijeh, and my Nakhil Beduin should set out on his return home. I then stopped here, changed my clothes, putting on the last clean suit I possessed, but to no purpose, for after one night and half a day I was in the same state

as before. But with the exception of this discomfort I did very well. They had all become my friends, and taken a liking to me. They found me different from the traders and quacks, who wander about in the Desert, intending only to cheat the credulous Beduin. They brought me more than I could consume of the delicious milk of the Desert, and I made up for the scanty fare on which I had lived during the greater part of my journey. Within a few days it was known in the whole neighbourhood that a physician had arrived, and people came from remote parts partly to ask my advice, and partly to bring sick people who were unable to move. I was sorry most frequently to have to decline; not because I feared to be unable to help them, but because I knew that our manner of treating disorders often produces more mischief than benefit in the Desert. How will you, for instance, in an open tent where you always are exposed to colds, and in the Desert where no regular diet can be observed, cure an inveterate secondary or tertiary syphilis, which occurs so often among these Beduins, producing old ulcers, bone-tumours, &c. ? It was, then, this in every respect unfortunate vocation of a physician that made me hasten my departure from these excellent sons of the Desert.

The 4th of February the whole Ferik moved to a distance of about two hours' journey, where another Ferik was encamped, consisting of about fifty tents. Thus we formed here a Ferik of about a hundred tents, the largest I ever remember to have visited. But I was not destined to stay long with them. Already, on the following day, my host saddled his camel, and we set out on the road to A'lai-bab-ollah. We crossed Judea's hills and valleys, resembling the landscape I had seen on the northern side of the Shera mountains, about Tafileh. The country consists mostly of naked hills, without shrubs or trees. On our way we visited a rich Beduin, who had sent for me, and begged me not to pass his tent without calling and looking at his sore leg, which for more than six months had confined him to his tent. I here found a young man, of about my age, with an old fracture, in a most despairing condition and state of mind. He had, the preceding night, dreamt of me and my stores of medicaments, and that he should derive his recovery from them. He called himself a drowning man, stretching out his hands in despair to implore my assistance; he begged me to stay with him, and treat him at least until he was so far advanced that he could walk on crutches; he would give me the mare and her foal which grassed without the tent; he would present me with all his camels; he would even bestow on me his little daughter, a child of about five years, running about in the tent,—the most charming child I perhaps ever have seen, which made it impossible for me to remove my eyes from her. But I had to decline an offer which few perhaps of the true sons of Esculapius had declined; and, from true compassion for the man, and indulging in a faint hope of being able to benefit him, I began to consider if I could stay with him. But twenty to thirty days, which I at least thought necessary to produce an improvement of his condition, seemed too long a time for me, and the vermin on my body reminded me that I should find no peace here. I then prescribed regimen, diet, and poultices, gave him some ounces of salts, and some drachms of kali hydrojodicum (the hydriodate of potash), which I had yet from my last journey, and bid farewell to him, with the sincere wish that the Lord would restore him to health. Four piasters, which I demanded for my medicines, he was not able to collect, notwithstanding his great amount of property. Towards evening we overtook some other Arabs of a different tribe, called Ramadin. Here I found a very different reception from what I had got from the above-mentioned man. On hearing that I was a physician, they came by the dozen, and offered to have their pulse felt. But as I perceived that it was mockery from many, I turned them off, and was soon left in peace. Here were now, besides ourselves, several other guests,

among whom were four men from the small neighbouring town Sum'a, who related that men from the Grand Sheikh in Hebron were in their town to collect taxes for the Sultan. This frightened my Beduin, who begged the narrator to take me with him to his town and thence procure me a guide to Hebron. As I saw that my Beduin really was afraid and unwilling to proceed farther, and he besides had been very polite to me, had lodged me several days in his tent, given me an old Kufic silver coin which he had found among ruins in the Desert, and besides taken me this whole day's march without any hire, which is a rare thing, I agreed to his proposal, although the man of Sum'a demanded a large sum in payment from me. But he represented to me that I should come to a city, where I should find all that I desired, and that I there again should dwell under a roof. I consequently set out the following morning with my new companion. We breakfasted on the road with Arabs, who killed a good sheep, and later in the afternoon we reached the so-called city.

Here I was not a little surprised to find a town, consisting not of houses that were built, but of natural grottoes in the mountain. Most of them were large, roomy saloons, in which one could stand erect under the slanting roof, which in many was supported by fine natural pillars. As the large grottoes were all inhabited by one family or several, and they would not lodge me, being a stranger, among their women and children, a small, solitary grotto, partly natural in the mountain, partly formed by art, was assigned to me. This was a small hole resembling the cabin in a small vessel, so low, that when I knelt down my head reached up to the roof, and when I stretched myself out to sleep I filled its whole length.

In this hole I spent the first night and all the following day; but I had a most charming companion in a little fair-haired, blue-eyed girl of about six years, and two lively, rosy-cheeked boys of the same age, who, with their chat and games, beguiled the hours of the day. Besides, all the women went here unveiled; and it was an indescribable pleasure to me to see the handsome women of the East, and now especially the beauties of Syria, without the veil, which not only conceals but distorts all beauty. Everything had here a different appearance and a different character from what I had seen in Arabia and Egypt; all bespoke a nobler origin, however subsequently deteriorated. I have always and everywhere thought to find the original type of the country purer preserved in woman than in man. The Egyptian woman, for instance, in our times, appears to me perfectly the same as those we see painted on the ancient Egyptian tombs three or four thousand years ago, when one often recognises in the Egyptian Fellâh Arabic Beduin features. I even now and then, though rarely, thought to find an old, well-known feature from the Desert in a man, but never in a woman. I did not find a single one whom I could compare to a Beduin woman; they all had a peculiar, very agreeable type, somewhat oval face, which sometimes grew too long, insipid, and flat, as sometimes will be the case with their language if the accent be drawn too long. The men had often chestnut-coloured hair, abundant beard, with fair moustachios, often very fair, or shading into red; in general a plump shape, large calves, and thick ankles, which latter especially one never finds in the Beduin; a white skin, and generally a rosy complexion, finer than I have seen it anywhere; or a pale brown complexion, gently shaded with a faint red. The children were mostly fair-haired; many had blue eyes and rosy cheeks. I altogether felt more at home here, and they on their side were more free towards me. My Fellâh companion had meanwhile forgotten me the whole of the first day, on account of transactions with the tax-collector, and first in the evening did he come to fetch me to his own grotto, which was a large, roomy saloon, certainly four times as large as our Town-hall, and with two half-circular door apertures, between which stood a mighty Corinthian pillar.

Here dwelt two families, with ten children, and a large number of sheep, all pell-mell, and I in the midst of men and beasts. But the Fellâh is in general more active and energetic than the Beduin.

I saw here daily the great quantity of milk, of which the women churned butter in their large leather sacks, but tasted it rarely. Nor was my company so agreeable as in the other grotto; I missed especially the little talkative girl. Here were several boys of eight years of age, who rode their hobby-horse and jumped about all day long, but they were not exactly to my taste. You must, however, not think, as I at first thought, that these people had no other roofs above their heads than these grottos. They had a town or city, as I later learned, but at present they were on one of their spring excursions, and having left their regular habitations, they had taken up their abode in these natural grottos, of which the mountains are full. The same is the case with other towns in these parts. Traces are found everywhere of ancient towns, but all lie in ruins, and are left so in expectation of the delicious gardens of a future world prophesied by the Arab Prophet, and in consequence of the Sultan and his functionaries' paternal government. I did not leave this before the 7th of February, having as usual had a high altercation with my Fellâh host. The subject of the quarrel was my money, which was in five-franc pieces, and which he would not take at the commonly accepted value. Children and women crowded round me; but on seeing me immovable, put my money back into my pockets, and fearing that I might resolve to stay with them for a few days longer, they were silenced, and after a little while my host came back, and with many kisses on my beard declared himself satisfied with my demands. All hindrances being thus removed, we let loose our beast and set out. We now passed the nice little town, entered a very fine country, whose hills were clothed with the most beautiful green, partly in cultivated fields, partly pasture lands, and richly strewn with shrubs that reminded me of the juniper bushes of my own country. This tract was exceedingly beautiful, especially to me, who for so long a time had seen nothing but naked mountains. Early in the afternoon we reached Hebron, the old city of Abraham, now called *Medinet Alkhalil*. I was so accustomed to the towns of Arabia and Egypt that I was most agreeably surprised as I now from a hill surveyed a white, snug, stone-built city, every house almost adorned with a little cupola, and all around mountain-terraces, richly clothed with olive-trees. But my meditations were soon interrupted by a modernized Turk, in a long grey coat, who met me near the gate of the town, and informed me that, as I came from Egypt, I must keep the quarantine, and requested my guide to bring me and my luggage to a particular quarter of the city. He accompanied me himself, and informed me by the way that he, from politeness and benevolence, would exempt me from quarantine for fifteen piasters. The Turks are in certain cases accommodating people. I paid him instantly the required fifteen piasters, requesting that, upon my departure, he should write a certificate that I had kept my quarantine.

The 12th I here attended the Friday prayers in the mosque, beneath which Abraham's grave is said to be found, and which only one European, Ali Bey, and perhaps another, Moura, had visited before me. It was probably originally a Greek church; at least it has no trace of Mohammedan architecture. I passed four days in this extraordinary city, mostly in company with my guide, originally an Egyptian, but settled here for many years, and the above-mentioned inspector of the quarantine, who, after having seen the certificate from our Russian vice-consulate in Cairo, obtained due respect for me. But he bothered me in a different way. He had accidentally seen my watch, an indifferent Swiss one, which I had bought in Cairo for my Arabian journey, and he plagued me for two days beyond description to sell it to him. He sent one after the other to conclude the bargain; at last he sent a watchmaker, a

Jew who spoke Russian with me, made offer after offer, and demanded a return for his politeness in having let me out of the quarantine for fifteen plasters, and tried even by the threat of keeping me for a longer time in quarantine to frighten me into assent. This I learned all through my faithful porter, whom I had won entirely by feeding him and his child during the days that we lived together. The result was that he bought the watch for about what it had cost me. After all I was glad to get rid of it, for notwithstanding continual reparations it always gained five minutes in twenty-four hours; but the manner in which the Turk plagued me was intolerable.

The 15th of February, in the morning, I loaded a camel with my luggage and myself, and set out on my way to Jerusalem. The country preserved the same character—a fine verdant landscape, covered here and there with shrubs. Early in the afternoon we passed Bethlehem and other places of sacred memory, and about three hours before sunset we passed through the valleys of Himmon and Gihon toward the city. The neighbouring hills were full of Christian families, who were waiting to begin their Lent in the open air. It was their holiday, and it was quiet and peaceful in the delicious evening when I entered the City of Peace. But I had no time to yield to pious thoughts. The only Turkish inn here was filled with people, so that I could find no room; and the first night I spent in a miserable hole on Zion filled with dirt and all sorts of vermin, besides a troublesome band of Turkish soldiers, and with my mat spread on the ground. The next day I, however, found the Prussian vice-consul, Dr. Schultz, and, through his assistance, a room and a friend superior to any I hitherto had found on my journey. But on this day rain and bad weather set in, and cold and dirt, the like of which I had not seen for four years. Incessant rain and hail-showers kept me confined to the house for seven days. Now I have, however, wandered about, visited the Mount of Olives, with its holy places, where the Lord ascended to Heaven, where he taught the Lord's Prayer, the grotto where the Apostles wrote the Credo, &c. &c. I have wandered in the great sepulchral grottoes of the valley of Jehoshaphat and by Kidron's dried-up brook, traversed the Via Dolorosa to the sacred places at the burial vault of our Lord and the place of his crucifixion. I have penetrated into Solomon's great subterranean vaults, and the splendid Mohammedan mosque of Omar built over them, where the law is laid down that the Christian who is found within it has to choose between the abjuration of his father's faith and being burnt alive; yet I have avoided the difficult choice. My great turban and the long-studied *Sheikhamin* have saved me. Meanwhile I feel tired of this idleness. I intend in a few days to set out for Galilee, visit Nazareth, Capernaum, Jericho, &c., and lastly Tiberias. This I think will take me 20 or 30 days, so that I can return here at Easter, and soon after that repair to Cairo, in order to await my instructions, and then decide on my route, whether east or west.

I have written this narrative in the most various attitudes; at one time kneeling with my head bent over the paper, at another sitting on one leg with the paper leaning against the other knee, but most frequently stretched out on my stomach. Often have I had to slip away the paper and conceal it from a man of Damascus, who dwells in the adjoining room and often calls on me; therefore is the writing crooked, and the thoughts too often follow the direction of the lines.

G. A. WALLIN.

XXI.—*A Chronological Table, comprising 400 Cyclonic* Hurricanes which have occurred in the West Indies and in the North Atlantic within 362 Years, from 1493 to 1855; with a Bibliographical List of 450 Authors, Books, &c., and Periodicals, where some interesting Accounts may be found, especially on the West and East Indian Hurricanes.* By ANDRÉS POEY, Esq., of Havanna.

Communicated by DR. SHAW.

SINCE the valuable discovery, in the year 1821, by Mr. William C. Redfield, of New York, of the rotary and progressive movement of hurricanes, very able works and contributions have been published. Colonel Sir William Reid, of the Royal Engineers, followed Mr. Redfield in 1838, and wrote the first work on the Law of Storms, and Mr. Henry Piddington, President of Marine Courts of Inquiry at Calcutta, published his '*Sailor's Horn-book for the Law of Storms.*' The last-named gentleman has contributed twenty-three Memoirs on the Law of Storms in the Indian and China Seas, which have regularly appeared in the Journal of the Asiatic Society of Bengal, from 1839 to 1854. Messrs. Thom, Espy, Hare, Loomis, Dove, Mitchell, Bache, Pierre, Maury, Bassnett, Chappelsmith, Brewster, Sedgwick, Johnston, Evans, Rider, Birt, Kerhallet, Keller, Lefebvre, Hommey, and others have also contributed very valuable works and memoirs on the Law of Storms; although the first seven gentlemen do not agree in every point with Mr. Redfield's theory, supported by Reid and Piddington.

It has now been proved by the examination and careful analysis of perhaps more than a thousand logs and of some hundreds of storms, that wind, in hurricanes and common gales on both sides of the equator, has two motions; and that it turns or blows round a focus or centre in a more or less circular form, and at the same time has a straight or curved motion forward, so that, like a great whirlwind, it is both turning round and as it were rolling forward at the same time; but as Mr. Piddington† observes, "in others though our evidence is very deficient, and sometimes indeed we have none at all, we must assume it only to be true; but we do so on very strong grounds."‡

On the other hand nothing is known of the causes which produce hurricanes or gales in any part of the world, nor what causes the rotary (whirling) and progressive movement. Even Mr. Redfield, the father of the research in recent times, as Mr. Piddington calls him, had no particular theory as to the causes of circular storms (cyclones). He thought that our knowledge of their effects was not far enough advanced, and that it was unscientific to attempt to account for them, till better informed, by the exclusive action of any one or more causes, §

* The term *cyclone* has most happily been suggested by Mr. Piddington to express the circular or highly curved winds observed in the hurricanes, gales, storms, whirlwinds, &c. It is derived from the Greek *κυκλω*, which signifies, amongst other things, the coil of a snake; and without affirming the circle to be a true one, though the circuit may be complete, it expresses sufficiently the tendency to circular motion in these meteors.

† The *Sailor's Horn-book for the Law of Storms*, New York, 1843, p. 6.

‡ It can scarcely be assumed that the rotatory system must be applied to all storms. All the inquiries are considered to prove that the Great Tornado of 1839 in America originated and acted on ascensional force, according to Professor Espy's theory.—Ed.

§ Piddington, p. 15.

All these considerations, and many more which the object of this Memoir does not allow me to detail, have engaged me to collect together in a chronological table, all the cases mentioned in ancient and modern works, of hurricanes which have occurred in the West Indies and in the Atlantic Ocean, since the discovery of America up to the present period. At the same time to facilitate the study thoroughly of this important question, I have added a bibliographical review of what has been published on this subject. This second part appears to me to be as useful as the first, on account of the great time which it would otherwise take an inquirer to ascertain what has been done before him. The Chronological Table of Hurricanes, with the accompanying reference to the authors who mention them, leaves only the books themselves to be consulted.

The first author, to my knowledge, who has published a chronological list of the principal hurricanes which occurred in the West Indies, is M. Moreau de Jonnès. This list comprises 63 hurricanes from 1495 to 1821.*

The next list of hurricanes was published by "Stormy Jack," *alias* Lieut. Evans, R.N.; but it only comprises few cases during 123 years, from 1712 to 1835.†

In 1848 Lieut. Evans published a more complete chronological list of the hurricanes which occurred in the West Indies from 1493 to 1847, amounting to 70 cases; with interesting descriptions.‡

The third chronological list of hurricanes and severe gales in the West Indies, from their discovery to the year 1846, was published by Sir Robert H. Schomburgk.§ This list, from the year 1494 to 1846, a period of 352 years, contains 127 hurricanes and severe gales, which committed more or less injury in the West Indies.

Lastly, Mr. Alexander Keith Johnston, of Edinburgh, in the first edition of his valuable Physical Atlas, published in 1840, gives a chronological table of the principal hurricanes which have occurred in the West Indies within 162 years, from 1675 to 1837, with only 50 hurricanes. But, in the second edition of the Physical Atlas, which has not yet entirely appeared, he has increased that number to 127 hurricanes, in a period of 354 years, from 1493 to 1847.

Hitherto the most complete tables on the hurricanes of the West Indies are those of Schomburgk and Johnston, each of which comprises only 127 hurricanes.

The Table which I have the honour to present to the Royal Geographical Society is far more complete than any that has yet appeared; for it contains 400 hurricanes of the West Indies and Atlantic Ocean, which have occurred in a period of 362 years, from 1493 to 1855 inclusive.

In the list of authors, books, and papers treating of hurricanes, unconnected with the West Indies, North America, and the Atlantic Ocean, I have endeavoured to mention only the most important, neglecting many short accounts of gales which have occurred on the European Continent, for fear of giving too much extension to my Memoir. In the Chronological Table are only included the cases of hurricanes and strong gales which have occurred in the West Indies and North Atlantic, and few in the United States adjacent to the Atlantic.

I have to acknowledge my thanks to Mr. William C. Redfield, of New York, for the valuable information which he had the kindness to give me. I shall never forget the pleasant hours which I spent for several days with this learned philosopher, who gracefully helped me to transfer from his Meteorological Journal all the cases of hurricanes which were not indicated in my

* *Histoire Physique des Antilles Françaises*, Paris, 1822, p. 346.

† *London Nautical Magazine*, 1837, vol. i. p. 243.

‡ *London Nautical Magazine*, 1849, pp. 397, 453, 524.

§ *The History of Barbados*, London, 1848, p. 689.

own Table: these are given in my Table under the authority of *Mr. Redfield's Manuscript*. I must nevertheless say that I do not represent them all, as different in every case; for, on examination, many may be found to be the same hurricane observed on different parts of its course. I give a few illustrative notes on some instances in which the same hurricane, progressing from one latitude to another, has been taken for two or three different ones. I consider this Table of Hurricanes as being only the first step to facilitate inquiries on this important question on an enlarged scale.

If any names of authors who have written on hurricanes have been omitted, I should be glad to be informed, so that they may be inserted in a second paper which I shall publish shortly on the same subject.

A CHRONOLOGICAL TABLE, comprising 400 Cyclonic Hurricanes which have occurred in the West Indies and in the North Atlantic Ocean within 362 Years, from 1493 to 1855. By *Andrés Pöy*, of Havanna, Cuba.

DATE.	LOCALITIES.	AUTHORITIES.
1493. Feb. 12	North Atlantic	Columbus, Lieut. Evans (alias Stormy Jack), A Chronological List of the Hurricanes which have occurred in the West Indies since the year 1493, with interesting descriptions; Naut. Mag., 1848, pp. 397, 453, 524—Alex. Keith Johnston, Physical Atlas, Edinb., 1855-56, plate 19, p. 61—Capt. Thomas Southey, Chronological History of the West Indies, Lond., 1827, vol. i. p. 17.
1494. May 19-21	Cuba*	Jacobo de la Pezuela, Ensayo Histórico sobre la Isla de Cuba.
1494. June 16	St. Domingo ..	Sir Robert Schomburgk's History of Barbados, Lond., 1848—A Chronological List of Hurricanes and severe Gales in the West Indies, from their discovery to the year 1846, pp. 38 and 689—P. Martyr, Decades of the Ocean, 1st Decade, book iv., p. 26—Herrera—Evans—Southey, vol. i. p. 35.
1495.	St. Domingo ..	P. Martyr, Decade I. book v.—Ramusio, vol. iii. p. 7—Benzoni, lib. i. cap. 10—Herrera, lib. ii. cap. 18—Moreau de Jonnés, Hist. Phy. des Antilles, Paris, 1822, p. 386.
1496. Mar.?	Atlantic	Southey, vol. i. p. 41—Evans.
1498.	Cuba	Desiderio Herrera, Memoria sobre los Huracanes de la Isla de Cuba, Habana, 1847, p. 46.
1500. Aug.	Caribbean Islands	Moreau de Jonnés, p. 386.
1502. July 1, 2	St. Domingo ..	Charlevoix, Histoire de l'Île Espagnole, Amsterdam, 1733, vol. i. p. 281—Schomburgk—Johnston—Evans—Southey, vol. i. p. 76—Herrera, lib. v. cap. 2—Moreau de Jonnés.
1502. Dec. 5	Porto-Bello, St. Domingo.	Columbus—Evans—Johnston—Southey, vol. i. p. 82.

* Between Cape de Cruz and Manzanillo.

DATES.	LOCALITIES.	AUTHORITIES.
1504. Oct. 19	Atlantic	Charlevoix, vol. ii. p. 19—Southey, vol. i. p. 98—Evans.
1508. Aug. 3	St. Domingo ..	Oviedo, Hist. Gral. de las Indias, lib. vi. cap. 3—Piddington, The Sailor's Horn-book, New York, 1848, p. 260—Charlevoix, vol. ii. p. 63—Herrera—Schomburgk—Evans, Naut. Mag., 1841, p. 746—Southey, vol. i. p. 107—Johnston—Moreau de Jonnés.
1509. Feb. or Mar.	Gulf of Mexico	Hernandez de Cordova—Evans—Johnston.
1509. July 29	St. Domingo ..	Oviedo, lib. vi. cap. 3—Charlevoix, vol. ii. p. 63—Schomburgk—Southey, vol. i. p. 109—Johnston—Herrera, lib. vii. cap. 10—Moreau de Jonnés.
1510. July	St. Domingo ..	Moreau de Jonnés.
1526. Oct.	St. Domingo ..	Herrera, lib. x. cap. 10—Schomburgk—Southey, vol. i. p. 156—Evans—Johnston—Moreau de Jonnés.
1527.	Cuba	Desiderio Herrera, p. 46—Schomburgk—Humboldt, Essai Politique sur l'île de Cuba, Paris, 1826, vol. i. p. 97—Johnston—Ramusio, vol. iii.—Moreau de Jonnés.
1530.	Porto-Rico, Cuba.	Herrera—Schomburgk—Evans—Johnston—Moreau de Jonnés.
1548.	St. Domingo ..	Oviedo, cap. 10—Moreau de Jonnés.
1557.	Cuba	Huracan de 1846: Reseña de sus Estragos en la Isla de Cuba, Habana, 1846, p. 6.
1563.	Caribbean Islands	R. Bohun, A Discourse concerning the Origin and Properties of Wind, with an Historical Account of Hurricanes and other tempestuous Winds, Oxford, 1671, p. 260.
1588.	Cuba	Desiderio Herrera, p. 46—Reseña de los Estragos del Huracan de 1846, p. 5.
1591. Aug. 10	Lat. 35° N. ..	Southey, vol. i. p. 212—Evans—Johnston.
1623. Sept. 19	St. Christopher	Schomburgk—Southey, vol. i. p. 252—Evans—Johnston.
1642.	Windward Islands, Martinique.	Du Tertre, Histoire Générale des Antilles, Paris, 1667, vol. ii. p. 71—Southey, vol. i. p. 294—Evans—Humboldt, vol. i. p. 97.
1642.	Martinique ..	Du Tertre, vol. ii. p. 71—Humboldt, vol. i. p. 97—Southey, vol. i. p. 294—Evans.
1642.	St. Christopher, Martinique, Guadeloupe.	Du Tertre, vol. ii. p. 71—Schomburgk—Southey, vol. i. p. 294—Evans—Johnston—Humboldt, vol. i. p. 97—Moreau de Jonnés.
1650.	St. Christopher	Du Tertre, vol. ii. p. 29—Moreau de Jonnés.
1651.	Martinique ...	Du Tertre, vol. ii. p. 71—Schomburgk—Evans—Pelléprat, 2nd part, p. 21—Moreau de Jonnés.
1652.	Martinique, Guadeloupe, St. Christopher.	Du Tertre, vol. ii. p. 71—Schomburgk—Evans—Johnston—Pelléprat, vol. ii. p. 71—Moreau de Jonnés.
1653. July 13	St. Vincent	Du Tertre, vol. ii. p. 71—Pelléprat, vol. ii. p. 21—Moreau de Jonnés.

DATE.	LOCALITY.	AUTHORITIES.
1653. Oct. 1	St. Vincent* ..	Du Tertre, vol. ii. p. 71—Pelléprat, vol. ii. p. 21—Moreau de Jonnés.
1656.	Guadaloupe ..	Du Tertre, vol. ii. p. 71—Schomburgk, p. 689—Evans—Johnston—Southey, vol. ii. p. 14.
1656.	Antilles	Du Tertre, vol. ii. p. 71.
1657.	Guadaloupe ..	Du Tertre—Schomburgk—Capt. Langford, Phil. Tr., 1698, p. 407—Johnston—Moreau de Jonnés.
1658.	Antilles	Capt. Langford, p. 407.
1660.	Antilles	Capt. Langford, p. 407.
1664. Oct. 23, 23	Guadaloupe, Antigua.	Schomburgk—Southey, vol. ii. p. 53—Evans—Johnston.
1665. Oct.	Caribbean Islands	Capt. Langford, p. 407—Evans.
1666. Aug. 4, 5	Guadaloupe, Martinique, St. Christopher.	Du Tertre—Schomburgk, p. 689—Evans—Johnston.
1667. Aug. 19	Barbados, Nevis	Capt. Langford, pp. 407, 411, 413—Schomburgk—Harris, vol. ii. p. 258—Moreau de Jonnés.
1667. Sept. 1	St. Christoval	Schomburgk—Evans—Johnston—Du Tertre, Hist. des Antilles, vol. iii. p. 305.
1670. Aug. 18	90 leagues from Barbados.	Bohun, p. 286—Moreau de Jonnés.
1670. Oct. 7	Jamaica, Barbados.	Halliday, Natural and Physical History of the West Indies, Lond., 1837, p. 29—Schomburgk—Southey, vol. ii. p. 97—Evans—Johnston.
1674. Aug. 10	Barbados, Jamaica.	Halliday, p. 29—Schomburgk, pp. 45, 690—Evans—Johnston—Moreau de Jonnés.
1675. Aug. 31	Barbados	Halliday, p. 29—Hughes, Natural History of Barbados, Lond., 1750, p. 25—Boyer, History of Barbados, Lond., 1808, p. 101—Capt. Langford, p. 415—Schomburgk—Reid, Attempt to develop the Law of Storms, 3rd edit., p. 31; 2nd edit., p. 34—Evans—Johnston—Southey, vol. ii. p. 111—Springer's Almanac for 1842—Mathieson's Tobago Almanac—Moreau de Jonnés.
1680. Aug. 14	St. Domingo ..	Moreau de Mery, Description Topographique, &c., de la partie Française de St. Domingue, Philadelphie, 1797, vol. i. p. 526.
1681.	Antigua	Schomburgk—Thomson's Meteorology, Lond., 1849, p. 412—Evans—Johnston—Southey, vol. ii. p. 121—Robert Montgomery Martin, Colonies of the British Empire, Lond., 1839, p. 80—Dampierre, vol. ii. p. 348—Moreau de Jonnés.
1688. March 1	E. of Jamaica ..	Coll. Acad., i. c. p. 583—Phil. Trans. vol. ii. p. 572—Hist. des Anc. Rév. du Globe, p. 299—Perry.
1691.	Antilles	Moreau de Jonnés.
1692. June 7	Jamaica	Oldmixon's British Empire, Lond., 1741, vol. ii. p. 394—Johnston—Redfield's MSS.

* These two hurricanes, according to Du Tertre, are different.

DATE.		LOCALITIES.	AUTHORITIES.
1692. Oct.	24	Cuba	Desiderio Herrera, p. 46.
1694. Aug.	13	James Fort, Barbados.	Schomburgk—Moreau de Jonnés.
1694. Oct.	17	Barbados	Schomburgk, pp. 45, 690—Evans—Johnston.*
1695. Oct.	2	Martinique	Labat, <i>Nouveau Voyage aux Iles de l'Amérique</i> , Paris, 1742, vol. ii. p. 224, 278—Moreau de Jonnés.
1700.		Barbados	Halliday, p. 30—Schomburgk, pp. 45, 690—Moreau de Jonnés.
1701. Apr.	3	Antilles	Labat, vol. ii. p. 281.
1702.		Barbados	Halliday, p. 30—Moreau de Jonnés.
1705. Feb.	7	Antilles	Labat, vol. ii. p. 468.
1707.		Nevis, Antigua	Martin, p. 80—Johnston—Evans—Alcôdo, vol. i. p. 118—Moreau de Jonnés.
1712. Aug.	28	Jamaica	Schomburgk—Bryan Edwards, <i>History of the West Indies</i> , Lond., 1805, vol. i. p. 197—Evans—Johnston—Aikman's <i>Jamaica Almanac for 1816</i> , p. 24—Moreau de Jonnés.
1712. Oct.		Cuba	Desiderio Herrera, p. 46.
1713.		Guadaloupe, St. Thomas.	Warden, <i>Chronologie Historique de l'Amérique</i> —Schomburgk.
1714. Aug. 13, 14		Guadaloupe ..	Warden—Schomburgk.
1714. Aug. 29		Jamaica	Warden—Schomburgk.
1714.		Cuba†	Desiderio Herrera.
1718. Mar. 6, 7		St. Vincent....	Eyries, <i>Abrégé des Voyages</i> —Perrey.
1718. Sept.		Nevis	Smith's <i>Natural History of Nevis</i> , Cambridge, 1745, p. 240.
1720.		Barbados	Moreau de Jonnés.
1722. Aug. 28		Jamaica, Carolina, U.S.	Schomburgk—B. Edwards, vol. i. p. 197—Tegg's <i>Chronology</i> , Lond., 1824, pp. 149, 157‡—Rees' <i>Encyclopædia</i> , Art. Hurricane—Evans—Johnston—Southey, vol. ii. p. 231—Aikman's <i>Jamaica Almanac for 1816</i> , p. 24—Robert Renny's <i>History of Jamaica</i> , Lond., 1807, p. 48—Annals of Jamaica, by G. W. Bridges, London, 1828, p. 352—Henderson's <i>Jamaica Almanac for 1852</i> , p. 34§—Moreau de Jonnés.
1722. Aug. 31		Antilles	Rees' <i>Encyclopædia</i> .
1725.		Martinique ..	Jour. Hist., March, 1726—Perrey, p. 331—Huot, <i>Geol.</i> , vol. i. p. 112.
1726. Oct. 22		Jamaica	Long's <i>History of Jamaica</i> , Lond., 1774—Schomburgk—Southey, vol. ii. p. 239—Evans—Johnston—Aikman, p. 24.
1728. Aug. 19		Antigua	Schomburgk—Southey, vol. ii. p. 247—Evans—Johnston.
1728.		Carolina, U.S.	Redfield's <i>MSS.</i> —Tegg, p. 157.
1730.		Cuba	Desiderio Herrera— <i>Reseña de los Estragos del Huracan de 1846</i> , p. 6.

* Cotte says on the 13th of October—*Mém. des Sav. Et.*, vol. vii. 1773, p. 588.

† This hurricane mentioned by D. Herrera may probably be one of the two which happened in the month of August of the same year.

‡ Tegg says Aug. 20 in one place, and at p. 153, Aug. 26.

§ According to Henderson's *Jamaica Almanac for 1852*, it happened in that island on the 22nd Aug.: p. 34.

DATE.	LOCALITIES.	AUTHORITIES.
1731.	Barbados	Hughes, p. 29—Halliday, p. 30—Schomburgk, pp. 46, 690—Moreau de Jonnés.
1733. June	St. Kitts	Tegg, p. 157.
1733. July 16	Cuba	Desiderio Herrera.
1734. Sept. 1	Jamaica	Schomburgk—Tegg, pp. 149, 167—Southey, vol. ii. p. 258—Evans.
1737. Sept. 9	St. Domingo, St. Kitts, Montserrat.	Schomburgk—Evans—Johnston—Southey, vol. ii. p. 263.
1738.	Gundaloupe, St. Thomas.	Schomburgk—Warden—Knox's Historical Account of St. Thomas, New York, 1852, p. 215.
1739. Sept. 9	Antilles	Gentleman's Magazine.
1740. Aug.	Antigua, Martinique, Dominica.	Tegg, p. 157—Evans—Johnston—Southey, vol. ii. p. 278—Martin, p. 80.
1740.	Porto Rico	Schomburgk—Warden—Ledrô, Voyage aux Iles de Ténériffe, la Trinité, St. Thomas, St. Croix, et Porto Rico, Paris, 1810, p. 182—Nogaret—Moreau de Jonnés.
1742.	St. Thomas ..	Knox, p. 215.
1744. Oct. 20	Jamaica	Schomburgk—Evans—Johnston—Southey, vol. ii. p. 301—Tegg, pp. 147, 153, 157—Henderson, Jamaica Almanac for 1852, p. 34—Aikman, p. 24—B. Edwards, vol. i. p. 197—Moreau de Jonnés.
1744. Nov.	Cuba	Desiderio Herrera.
1745.	Caribbean Islands	Evans.
1746. Jan.	Lat. 40° N.	Evans.
1747. Sept. 21	St. Christopher, Leeward Islands	Schomburgk—Evans—Johnston—Southey, vol. i. p. 305.
1747. Oct. 24	St. Christopher, Leeward Islands.	Schomburgk—Evans—Johnston—Southey, vol. i. p. 305.
1751. March 7	Jamaica	Redfield's MSS.
1751. Aug. 10	Jamaica	Tegg, pp. 149, 157.
1751. Sept. 2	Jamaica	Evans—Aikman, p. 24.
1751. Sept. 15	St. Domingo ..	Hist. de l'Acad., 1752, p. 17.
1751. Oct.	Jamaica, St. Domingo.	Moreau de Jonnés.
1752. Sept.	Charleston, U.S.	Redfield's MSS.
1753. Sept. 15	Charleston, U.S.	Tegg, p. 134.
1754. Sept.	St. Domingo ..	Schomburgk—Johnston—Evans—Southey, vol. i. p. 317.
1756. Aug. 23	Barbados	Redfield's MSS.
1756. Sept. 12	Martinique	Schomburgk—Tegg, pp. 150, 157—Chavalon, Voyage à la Martinique, Paris, 1763, p. 15—Moreau de Jonnés.
1757.	Florida to Boston	Warden, Account of United States, vol. i. p. 155.
1757. Aug. 29	Barbados	Collection Académique, Dijon, 1761, partie étrangère, vol. vi. p. 647.
1758. Aug. 23	Barbados, South Carolina, U. S.	Tegg, pp. 157, 162.
1759. Sept.	Gulf of Mexico	Schomburgk—Johnston—Evans—Quarterly Review, vol. xiv. p. 374—Southey, vol. i. p. 335.
1761. May 4	Charleston, U.S.	Tegg, p. 157.
1761. June 1	Charleston, U. S.	Phillips's Barbados Almanac for 1839, p. 123.

DATE.	LOCALITIES.	AUTHORITIES.
1762. Dec. 9	Cartagena . . .	Schomburgk—Tegg—Evans.
1765. July 31	Martinique, St. Eustatius, Guadalupe.	Redfield's MSS.—Evans—Johnston.
1765. Sept.	Martinique, Guadalupe, St. Christopher.	Moreau de Jonnés.
1765. Nov. 13, 14	St. Domingo ..	Moreau de St. Mery, vol. i. p. 526.
1766. Aug. 13	Martinique . . .	Schomburgk, pp. 41, 630—Warden, vol. vii. p. 341—Evans—Johnston—Southey, vol. ii. p. 391—Moreau de Jonnés—Perrey.
1766. Aug. 16	West of Jamaica	Warden.*
1766. Sept. 11	Virginia, U.S. . .	Redfield's MSS.
1766. Sept. 13-15	St. Christoval, Montserrat.	Schomburgk—Annual Register—Evans—Johnston—Southey, vol. ii. p. 390.
1766. Sept. 21	St. Eustatius, Tortuga.	Evans—Johnston—Southey, vol. ii. p. 390.
1766. Oct. 6	Dominica, St. Eustatius, Guadalupe.	Schomburgk—Annual Register—Southey, vol. ii. p. 390—Cotte, <i>Mém. des Savans Etrangers</i> , vol. vii. 1773, p. 478.
1766. Oct. 22	Pensacola . . .	Schomburgk—Annual Register—Southey, vol. ii. p. 390—Evans—Johnston.
1768. Aug. 12	Grenada	Grenada Almanac for 1832.
1768. Oct. 15	Cuba	Desiderio Herrera—Reseña de los Estragos del Huracan de 1846, p. 6—Memorias de la Sociedad Económica de la Habana, vol. i., segunda parte, Enero, 1846, p. 35—Perrey, p. 336.
1768. Oct. 25	Cuba (Havanna)	Schomburgk—Annual Register—Thomson's Meteorology, London, 1849, p. 413—Southey, vol. ii. p. 398—Evans—Johnston.
1769. Aug. 30	West of Florida	Redfield's MSS.
1769. Oct. 29	East of Florida	Bernard's Roman History—Redfield's MSS.—Tegg, p. 132.
1770. June 6	Charleston ..	Perrey, p. 336.
1771. Aug.	St. Eustatius ..	Gaz. de France, 19 Oct. 1772—Perrey.
1772. Aug. 4	St. Domingo ..	Schomburgk—Warden—Nicholson, p. 129—Moreau de Jonnés.
1772. Aug. 16	Cuba? (St. Jago)	Tegg, p. 157,†
1772. Aug. 17	Antigua	Tegg, p. 149—Martin, p. 80.
1772. Aug. 28	Porto Rico, Jamaica.	Schomburgk, pp. 42, 691—Warden, vol. viii. p. 457—Knox, p. 215—Ledru, p. 182—Moreau de Jonnés.
1772. Aug. 31	Leeward and Virgin Islands, Antigua.	Schomburgk—B. Edwards, vol. iii. p. 620—Tegg, pp. 149, 157—Espy's Philosophy of Storms, Boston, 1841, p. 11—Evans—Johnston—Southey, vol. ii. p. 409.

* It is not probable that the first hurricane of August, felt at Martinique, was the same that passed west of Jamaica, unless its progression was towards the west, and south of that island; so that the east track of the cyclone would have been felt at Jamaica. If the hurricane had followed its natural course to the north-west, the west track of the cyclone could not be felt west of Jamaica without experiencing at the same time the east track on the east, and the centre of the cyclone would have passed through the island.

† Tegg does not say to which of the West Indian islands St. Jago belongs, but I presume it is to Cuba.

DATE.	LOCALITIES.	AUTHORITIES.
1772. Sept. 1-4	Dominica, St. Domingo.	Thomas Atwood's History of Dominica, London, 1791, p. 11—Moreau de Jonnés—Moreau de St. Mery, vol. ii. p. 807.
1772. Nov. 22	St. Christopher, St. Eustatius.	Phillips.
1773. July	St. Thomas, Cuba	Tegg, p. 157.
1773. Aug.	Boston *	Tegg, p. 157.
1774. Sept. 6	Guadaloupe ..	V. Hoff. I. c.—Cotte, Jour. de Phy. vol. lxxv. p. 151—Perrey.
1774. Oct. 2	Jamaica	Schomburgk—Warden.
1775. July 30	St. Croix, Martinique.	Cotte, Jour. de Physique, 1807, vol. lxxv. p. 167—Moreau de Jonnés.
1775. Aug. 25	Martinique . . .	Cotte, p. 167—Moreau de Jonnés.
1775. Aug. 27	St. Domingo ..	Moreau de St. Mery, vol. ii. p. 807.
1775. Sept. 14	Cuba, St. Domingo.	Cotte, p. 168.
1775. Oct. 16	St. Christopher	Cotte, p. 168.
1776. Sept. 4	Antigua, Martinique, Guadaloupe.	Phillips—Moreau de Jonnés.
1776. Sept. 5, 6	Martinique, Guadaloupe, St. Kitts.	Schomburgk—Tegg, pp. 149, 157, 162—Phillips†—Coll. Acad.—V. Hoff. I. c.—Cotte, Jour. de Phy., t. lxxv. p. 151, 152—Perrey.
1778. Oct. 28	Cuba	Desiderio Herrera—Memorias de la Soc. Económica de la Habana, vol. i., January, 1846, p. 36.
1779. . . .	New Orleans ..	Dunbar, Trans. Am. Soc. Philad., vol. vi., second series, 1804.
1780. Aug. 25	St. Kitts, New Orleans.	Redfield's MSS.—Dunbar, <i>idem</i> .
1780. Oct. 3-12	Jamaica, Cuba, Martinique, Barbados.	Schomburgk—B. Edwards, vol. i. p. 197—Ann. Register—Piddington, 2nd edit., p. 167—Pardy, Northern Atlantic Ocean, 7th edit., p. 101—Espy, p. 190—Reid's Law of Storms, p. 304; and Attempt to develop the Law of Storms, 3rd edit., pp. 289-292, 335, Chart IX.—Evans—Johnston—Long, vol. iii. p. 622—Atwood, p. 11—Scots Magazine, vol. xlii. 1780, p. 652—Southey, vol. ii. p. 471—Tegg, p. 157—Henderson, p. 36—Aikman, p. 24—Moreau de Jonnés.
1780. Oct. 10-18	Barbados, Dominica, Antigua, Tobago, Grenada, St. Vincent, St. Domingo.	Schomburgk—Annual Register—Warden—Halliday, p. 30—Piddington, p. 147—Boyer, p. 447—Thomson, p. 413—Blane, Tr. Ed. Royal Soc., vol. i. 1788, p. 34—Grenada Almanac and Public Register for 1832—Espy, pp. 193, 253—Traced by Reid, Attempt to develop, 3rd edit., pp. 289-337—Southey, vol. ii. p. 467—Martin, p. 80—Atwood, p. 11—Antigua Almanac for 1832—Mathieson's, Tobago

* This hurricane is probably the same which happened in July at St. Thomas and Cuba, and reached Boston in August.

† Phillips gives these two hurricanes of Sept. 4th and 5th as different ones, but it is probable that they form but one. Tegg, p. 157, says that it was the severest ever known in the West Indies.

DATE.	LOCALITIES.	AUTHORITIES.
1780. Oct. 16	Cuba	go Almanac for 1840—St. Vincent Almanac for 1851, p. 81—Moreau de St. Mery, vol. i. p. 526—Cotte, Jour. de Phy., 1807, vol. lxxv. p. 331—London Athenæum, Nov. 3, 1855, p. 1273. Desiderio Herrera—Piddington, p. 45—Reid's Attempt to develop, p. 394-402, 3rd ed.
1780. Oct. 31	Barbados.....	Phillips.
1781. March 13	West Indies....	Phillips.
1781. Aug. 1	Jamaica	Schomburgk—B. Edwards, vol. i. p. 197—Annual Register—Evans—Johnston—Tegg, pp. 149, 157—Southey, vol. ii. pp. 496, 499—Naval Chronicle, vol. ii. p. 286—Aikman, p. 24—Cotte, Jour. de Phy., 1807, vol. lxxv. p. 334—Moreau de Jonnés.
1781. Aug. 10	North Carolina, U.S.	Redfield's MSS.
1781. Sept. 5	St. Domingo ..	Moreau de St. Mery, vol. ii. p. 807.
1782. April 12	North Atlantic	Thomson, p. 43.
1782. July 25	Lat. 43° 33' N. long. 42° 20' W.	Evans.
1782. July 31	Kingston (Jamaica),	Mercure de France, 9, 30 Oct. 1784—Mémoires de l'Acad. de Dijon, 1784, p. 78—Perrey.
1782. Aug. 1	Jamaica	Annual Register.
1782. Sept. 16	North Atlantic	Philadelphia Paquet, Dec. 17th, 1782; Feb. 17th, 1783—Redfield's MSS.
1784. March 8	Cuba	Desiderio Herrera—Reseña de los Estragos del Huracan de 1846, p. 6.
1784. July 10	Jamaica	Henderson.*
1784. July 30	Jamaica, St. Domingo.	Schomburgk—B. Edwards, vol. i. p. 197—Westminster Magazine—New Haven Gazette, U. S., Sept. 23rd—Connecticut Current, U. S., Sept. 28th, Oct. 6th—Evans—Johnston—Southey, vol. iii. p. 3—Tegg, pp. 149, 153—Aikman, p. 24—Cotte, Jour. de Phy., 1807, vol. lxxv. p. 342—Moreau de Jonnés—Perrey.
1785. July 6	West Indies....	Tegg, p. 158.
1785. July 25	St. Croix	New Haven Gazette, U. S., Sept. 29th.
1785. Aug. 25	Guadaloupe ..	Redfield's MSS.†
1785. Aug. 27	Jamaica	Schomburgk—B. Edwards, vol. i. p. 197—New Haven Gazette, U. S., Oct. 9th—Evans—Johnston—Southey, vol. iii. p. 7—Aikman, p. 24.
1785. Aug. 31	Guadaloupe, Barbados, St. Domingo.	Schomburgk—Warden—Moreau de Jonnés.

* Another dreadful earthquake and hurricane, July 10th, 1784, Jamaica Almanac for 1852, p. 36. It seems strange that Henderson mentions this hurricane as having been dreadful, but does not say anything about the second, although far more severe, which occurred on the 30th of the same month.

† This hurricane, taken from Mr. Redfield's MSS., may have some connexion with that of the 31st of the same month, which happened also at Guadaloupe. Cotte mentions another which happened at St. Christopher and other islands on the 24th of the same month of August, Jour. de Phy., 1807, vol. lxxv. p. 345.

DATE.	LOCALITIES.	AUTHORITIES.
1783. Sept. 22-24	Carolina, Virginia, U. S.	New Haven Gazette, U. S., Oct. 13th.
1783. Sept. 27	St. Domingo ..	Moreau de St. Mery, vol. i. p. 525.
1786. Aug. 11	St. Domingo, St. Eustatius, Barbados.	Schomburgk — Evans — Tegg, p. 158 — Southey, vol. iii. p. 11.
1786. Aug. 29	United States ..	Philadelphia Paquet, Jan. 22nd.
1786. Sept. 2	Barbados	Schomburgk — Warden, vol. viii. p. 516 — Madden — Evans — Johnston — Tegg, p. 132 — Southey, vol. iii. p. 11 — Moreau de Jônès.
1786. Sept. 10	Guadaloupe	Schomburgk — Evans — Southey, vol. iii. p. 11.
1786. Oct. 5	Barbados, Grenada.	Phillips.
1786. Oct. 20	Jamaica	Schomburgk — B. Edwards, vol. i. p. 197 — Evans — Johnston — Southey, vol. iii. p. 11 — Aikman, p. 24.
1787. April	United States, Bermudas.	Redfield's MSS.
1787. July 30	United States ..	Redfield's MSS.
1787. July.	Guadaloupe, French islands	Tegg, p. 158.*
1787. Aug. 3	Dominica	Schomburgk — Annual Register — Southey, vol. iii. p. 14 — Johnston — Evans.
1787. Aug. 15	Florida	Redfield's MSS.
1787. Aug. 23	Dominica	Schomburgk — Annual Register — Evans — Johnston — Southey, vol. iii. p. 14.
1787. Aug. 29	Dominica	Schomburgk — Annual Register — Southey, vol. iii. p. 14 — Johnston — Evans.
1787. Sept. 2	Honduras	Redfield's MSS. — Cotte, Jour. de Phy., vol. lxx. 1807, p. 351.
1787. Sept. 19	United States ..	Redfield's MSS.
1787. Sept. 23	Belize	Schomburgk — Evans — Piddington, p. 156 — Southey, vol. iii. p. 13.
1787. Dec. 1	West Indies ..	Phillips.
1789. Jan. 1	Honduras	Phillips.
1788. Mar. & Apr.	St. Croix	Cotte, Jour. de Phy., vol. lxx. p. 352.
1788. July 22	United States ..	Redfield's MSS.
1788. Aug. 14	Martinique	Schomburgk — Warden — Moreau de Jônès.
1788. Aug. 16	Porto Rico, St. Domingo.	Redfield's MSS. — Cotte, Jour. de Phy., vol. lxx. 1807, p. 352 — Moreau de St. Mery, vol. ii. p. 301.
1788. Aug. 19	United States ..	Redfield's MSS.†
1788. Aug. 29	Dominica	Redfield's MSS.
1788. Sept. 19, 20	United States ..	Redfield's MSS.
1790. Aug.	Nevis	Evans — Johnston.
1790. July 31	Jamaica	Tegg, p. 149.
1791. June 21	Cuba	Desiderio Herrera — Annual Register.
1791. Sept. 27	Cuba	Phillips (Sir R.), Chronology, Lond., 1821.

* This hurricane is probably the same which reached the United States on the 30th, mentioned in Mr. Redfield's MSS.

† These three hurricanes may probably be the same one on its course from Martinique to the United States. According to Courrejollès, a hurricane also occurred in the same month of August at St. Domingo. — Journal de Physique, vol. liv. 1802, p. 107.

DATE.		LOCALITIES.	AUTHORITIES.
1792.	July 15	West Indies ..	Redfield's MSS. — Connecticut Journal, U. S.
1792.	Aug. 1	Antigua	Schomburgk — Annual Register — Evans — Johnston — Martin, p. 80 — Southey, vol. iii. p. 64 — Moreau de Jonnés.
1792.	Aug. 6	Bermudas, U. S.	Redfield's MSS. — Connecticut Journal, U. S., 29th of Aug.
1792.	Sept. 10	Antigua	Phillips.
1792.	Oct. 29	Cuba	Desiderio Herrera — Reseña de los Estragos del Huracan de 1846, p. 7 — Memorias de la Sociedad Económica de la Habana, vol. i. 2a. Serie, 1846, p. 38.
1793.	Aug. 12	St. Christoval, St. Eustatius, St. Thomas.	Schomburgk — B. Edwards — Knox, p. 215 — Connecticut Journal, 25 Sept. — Moreau de Jonnés.
1794.	Aug. 27, 28	Cuba	Desiderio Herrera — Memorias de la Sociedad Económica de la Habana, vol. i. 2a. Serie, 1846, p. 38 — Schomburgk — Warden — Humboldt, Essai Politique sur l'Île de Cuba, Paris, 1826, vol. i. p. 96-98 — Humboldt, Relation Hist., vol. xi. p. 174 — La Sagra, Hist. Politique, &c., de Cuba, Climat, vol. i. p. 154.
1795.	Aug. 10	Jamaica	Evans — Johnston.
1795.	Aug. 18	Antigua	Schomburgk — B. Edwards.
1796.	Oct. 3	Bahamas	Schomburgk — B. Edwards — Humboldt, Essai Politique sur Cuba, vol. i. p. 26 — Tegg, p. 132.
1796.	Oct. 24	Cuba	Desiderio Herrera — Reseña de los Estragos del Huracan de 1846, p. 7.
1796.	Nov. 2	Cuba	Humboldt, Essai Politique sur Cuba, vol. i. p. 96.
1799.	....	Cuba	Desiderio Herrera.
1800.	Nov. 2	Cuba	Desiderio Herrera.
1801.	July 22	Nassau	Schomburgk — Warden — Tegg, p. 132.
1802.	Feb. 21-23	Charleston to Nova Scotia.	Redfield's MSS. — New York Newspapers.
1802.	Sept. 16	Cumana	Humboldt, Essai Pol. sur Cuba, vol. i. p. 96.
1803.	July 10	Bahamas	Redfield's MSS.
1804.	Aug. 29	Jamaica	Redfield's MSS.
1804.	Sept. 3-9	Martinique, Caribbean Islands, U. S.	Schomburgk — B. Edwards — Warden, A Statistical, Political, and Historical Account of the United States of America, Edinb. 1819, vol. i. p. 155 — Purdy, 7th Edit. p. 102 — Mease's Geological Account of the United States, p. 100 — Medical Repertory, Hex. vol. i. and Hex. ii., vol. ii. p. 354 — Evans — Moreau de Jonnés — Redfield's Track IV.
1804.	Sept. 3	Windward Isles	Johnston.
1804.	Sept. 3-6	Leeward Islands	Johnston.*
1804.	Sept. 23	Jamaica, Lat. 20° 18' N.	Redfield's MSS.
1804.	Oct. 4	Savanna, Georgia	Barr's Letters — Redfield's MSS.

* Could not these last two hurricanes of Sept., given by Mr. Johnston as different, be the same which occurred between the 3rd and 9th of the same month, from Martinique to the United States, and traced by Redfield?

DATE.	LOCALITIES.	AUTHORITIES.
1804. Oct. 9	United States ..	New York Herald, 24th October—Redfield's MSS.
1805. July 27	Jamaica	Schomburgk.
1805. July 29	Lat. 26° 17', long. 37° 42', North of Bar- bados.	Purdy, 7th Ed.—Lieut. John Evans, Re- vision of Geographic and Hydrographic Terms, 1824, p. 116—Idem, Chrono- logical List of Hurricanes—Johnston.
1806. Aug. 30	Bahamas, Eleu- thera.	Schomburgk—Thomson, p. 414—Scoresby, Memoirs of Sea, p. 332—Evans—John- ston.
1806. Sept. 9	Dominica	Schomburgk—B. Edwards—Thomson, p. 414—Evans—Johnston—Phillips.
1806. Sept. 24	Dominica	Schomburgk.
1806. Sept. 27	West Indies ..	Evans.*
1806. Oct. 5	Bahamas	Schomburgk, p. 51, 692—Evans—Johnston.
1806. Oct. 27	Bahamas	Schomburgk.
1807. July 25-28	St. Christoval, Montserrat.	Schomburgk—Moreau de Jonnés.
1807. Sept. 5	Cuba	Desiderio Herrera.
1809. July 27	Dominica, Gua- daloupe.	Schomburgk.
1809. Aug. 1-3	Dominica, Gua- daloupe.	Schomburgk—Redfield's MSS.—Cotte, Jour. de Phy., vol. ix, p. 204.
1809. Sept. 2	Guadaloupe, Por- to-Rico.	Schomburgk—Evans—Johnston.
1809. Oct. 13	Martinique	Schomburgk—Evans.
1809. Oct. 18	Trinidad	Schomburgk.
1810. Aug. 12	Trinidad, Barba- dos.	Schomburgk—Derrotero de las Antillas.
1810. Aug. 28	Barbados	Phillips.
1810. Sept. 28	Cuba	Desiderio Herrera—Tegg, p. 146.†
1810. Oct. 25, 26	Cuba	Desiderio Herrera.
1812. Aug. 14	Jamaica	Evans.
1812. Aug. 19	New Orleans ..	Redfield's MSS.‡
1812. Oct. 12	Jamaica	Schomburgk—Evans—Henderson, p. 37— Altman.
1812. Oct. 14	Jamaica	Schomburgk, pp. 52, 693—Johnston.
1812. Oct. 14	Trinidad in Cuba	Southey, vol. iii, p. 519§—Evans.
1813. July 20	Bermuda	Phillips.
1813. July 22	Barbados	Schomburgk.
1813. July 22, 23	Dominica, Mar- tinique, St. Christoval.	Schomburgk—B. Edwards—Tegg, p. 136 —Falconer's Dominica Almanac for 1850—Southey,|| vol. iii, p. 521—Moreau de Jonnés.

* This hurricane may be the same as that of the 24th, which happened at Dominica.

† Tegg says Sept. 23, 26.

‡ This hurricane is probably the same which was felt at Jamaica on the 14th.

§ This hurricane seems to be the same which occurred at Jamaica on the same day or two days previous, although, as the nearest point of that island is only 23 leagues from Cuba, it is more probable that the hurricane took place at both islands on the same day, with some difference in the hours. There may be some error in dating the previously mentioned hurricane at Jamaica on the 12th, although Schomburgk mentions it as distinct from that of the 14th.

|| Southey says that during this year the island of Dominica suffered considerably from two hurricanes which succeeded each other within a short time: several houses were blown down.

DATE.	LOCALITIES.	AUTHORITIES.
1813. July 26	Bermuda, Bahamas.	Schomburgk—B. Edwards—Howard, Climate of London, 3rd Edit., 1833, vol. i. —Espy, Phil. of Storms, p. 252—Tegg, p. 132.
1813. July 31	Jamaica	Schomburgk — B. Edwards — Moniteur, July 10, 1814—Perrey, p. 344.
1813. Aug. 1	Jamaica	Evans—Johnston—Aikman.
1813. Aug. 5-9	N. Atlantic, lat. 41°.	Redfield's MSS.*
1813. Aug. 25	Dominica	Schomburgk—B. Edwards—Howard, vol. ii. p. 212.
1813. Nov. 19	Nova Scotia ..	Marine Dictionary.
1813. . . .	Belize	Naut. Mag., 1842, p. 732.
1815. Aug. 9	Gulf Stream, lat. 40°, long. 60°.	Purdy, 9th Ed.—Evans—Johnston—Ren- nell, Investigation, pp. 169, 202, 238.
1815. Aug. 31 to Sept. 1	N. Atlantic, lat. 39°, long. 56°, Bartholomew.	Redfield's MSS.—Southey, vol. iii. p. 610† —Johnston—Evans.
1815. Sept. 18-23	St. Bartholomew	Redfield's MSS.—Purdy, 7th Ed., p. 102— Evans—Johnston.‡
1815. Sept. 20	Turk's Island ..	Southey, vol. iii. p. 610.
1815. Sept. 29	Barbados	Schomburgk.
1815. Oct. 18	Jamaica	Schomburgk—Annals of Jamaica—Thom- son, p. 404—Arnold, Edin. Phil. Jour., vol. vii. p. 257—Aikman, p. 26.
1816. Sept. 15	Barbados, Mar- tinique, Domi- nica.	Schomburgk—Tegg—Moreau de Jonnés.
1816. Oct. 16	Dominica, Mar- tinique.	Schomburgk.
1817. Sept. 15	Dominica	Schomburgk.
1817. Oct. 21	Small islands, St. Vincent.	Howard, vol. ii. p. 350—Philadelphia Paquet—Phillips—St. Christopher Al- manac for 1855—Moreau de Jonnés.
1817. Oct. 23	Barbados, St. Lucia, Martini- que.	Phillips.
1818. Aug. 23	Bermuda	Schomburgk.
1818. Sept. 10-12	Cayman Isles, Campeche.	Evans.
1818. Sept. 19	St. Domingo ..	Evans.
1818. Sept. 21	Barbados, Do- minica.	Evans.
1818. Sept. 22-25	Antigua	Evans.§
1818. Sept. 27-30	Barbados	Schomburgk.
1818. Oct. 7	Port Royal (Ja- maica).	Evans.
1818. Oct. 21	St. Lucia	Howard, vol. ii.—Espy, Phil. of Storms, p. 252.

* This hurricane may have been the one which occurred on the 1st at Jamaica, and reached 41° the 5th; and also the same felt at Jamaica on the 31st of July. The *Moniteur* of Paris, 10th July, 1814, gives the date of the 28th of July.—Perrey.

† According to Southey about thirty sail were driven on shore at St. Bartholomew, but the gale did not reach Barbados.

‡ Sept. 18th at St. Bartholomew; the 20th at Turk's Island; the 23rd at Rhode Island, U. S. This hurricane led Mr. Redfield to the discovery of his cyclonic theory.

§ This hurricane must be the same mentioned also by Lieut. Evans as having been felt at Barbados and Dominica on the 21st of the same month.

DATE.	LOCALITIES.	AUTHORITIES.
1818. Nov. 17, 20	Jamaica (Cornwall County).	Sherlock's Jamaica Almanac for 1839, p. 115.
1819. Aug. 25	Dominica	Falconer's Dominica Almanac for 1850.
1819. Sept. 21, 22	St. Lucia, Barbados, Virgin Islands, Porto Rico.	Schomburgk—Knox, p. 215—Tegg, p. 159—Phillips—St. Christopher Almanac for 1855—Moreau de Jonnés.
1819. Oct. 13-15	Barbados, St. Lucia.	Schomburgk, pp. 51, 694—Tegg, p. 159—Springer's Almanac for 1842—Mathieson—Tobago Almanac for 1849—Moreau de Jonnés.
1819.	Cuba	Desiderio Herrera.
1821. Sept. 1	Guadaloupe ..	Schomburgk—Warden, vol. viii. p. 409—Johnston—Moreau de Jonnés.
1821. Sept. 1	Turk's Island to Long Island, U. S.	Schomburgk—Redfield's Track VIII. on his Chart of the Courses of Hurricanes—Pardy, 7th Ed., p. 102—Reid, Attempt to develop the Law of Storms, 3rd Ed., p. 11-15, Chart I.—Espy, Phil. of Stor., p. 209-228—Evans—Johnston—Redfield, Silliman's Journal, vol. xx. pp. 24-27; U. S. Naval Magazine, 1836, vol. i.; and Lond. Naut. Mag., 1836, vol. v. p. 199—Evans.
1821. Sept. 9	Antigua, St. Bartholomew.	Schomburgk.
1821. Sept. 20	New Haven, U. S.	Tegg, p. 159.
1821.	Cuba	Desiderio Herrera.†
1822. Mar. 11	Jamaica	Schomburgk.
1822. July 11	Mobile, U. S. . .	New York Gazette—Redfield's MSS.
1822. Dec. 18	Barbados	Schomburgk.
1824. July 26	West Indies ..	Morin, Correspondance pour l'Avancement de la Météorologie. Nevers, 1827, 3rd Memoir, p. 66.
1824. Sept. 7, 8	Guadaloupe ..	An. de Ch. et de Phy., vol. xxxiii. p. 408—Perrey.
1825. July 25, 26	Dominica, Martinique, Guadaloupe.	Schomburgk—Thomson, p. 416—Pouillet, Elem. de Phy., vol. ii. p. 717—Lardner's Natural Philosophy, p. 30—Perrey.
1825. Oct. 1	Cuba	Desiderio Herrera—Reseña de los Estragos del Huracan de 1846, p. 7—Ramon de la Sagra, Historia Física y Política de la Isla de Cuba, p. 117—Schomburgk—Warden.
1826. Aug. 18	Antilles	Moniteur, 16 Oct.—Perrey.‡
1826. Nov. 6-9	Atlantic, Teneriffe.	An. de Ch. et Phy., February 1835—Espy, p. 22—Redfield, Am. Jour. of Sc. and Arts, vol. xviii., 2nd Series, 1854.

* Are these two hurricanes of the 1st of Sept. different, or the same* which began at Guadaloupe, and proceeded to the northward? Mr. Redfield has traced it from above the lat. 20° and long. 65° off Turk's Island on the 1st of Sept.; and to the northward of the Bahamas, and near the lat. of 30°, on the 2nd. Mr. Johnston mentions the two hurricanes as being different: "on the same day," says he, "a hurricane at Guadaloupe destroyed 200 lives." Schomburgk is of the same opinion.

† This hurricane may be the same which happened at Antigua on the 9th, according to Schomburgk.

‡ This hurricane may have been the same one which occurred at Cuba during that year.

DATE.	LOCALITY.	AUTHORITIES.
1826.	Cuba	Desiderio Herrera—Reseña de los Estragos del Huracan de 1846, p. 7.
1827. July 30	North Carolina	Perrey.
1827. Aug. 17-28	Windward Islands to the Porpoise Bank, U. S.	Schomburgk—Redfield's Track III., Lond. Naut. Mag. 1836, vol. v. p. 199, and U. S. Naval Magazine, 1836, vol. i.—Purdy, 7th edit., p. 98—Evans—St. Christopher Almanac—Perrey.
1827. Aug. 28	St. Thomas, Virgin Islands.	Schomburgk—Evans—Johnston.*
1827. Sept. 7	N. Atlantic....	Purdy, 7th edit., p. 98.
1827. Oct. 11	Bahamas	Evans.
1827.	Belize	Naut. Mag., 1842, p. 732.
1828. Mar. 15	Gulf of Mexico	Purdy, 7th edit., p. 94.
1828. Sept. 19	N. Atlantic, N.W. of Bermuda.	Redfield's Track XVIII., Am. Jour. of Sc. and Arts, vol. xviii. 2nd Series, 1854.
1829. July 24	Boston, U. S. ..	Purdy, 7th edit., p. 98—Thomson, p. 416—Boston Gazette.
1830. Apr. 24, 25	Vern Cruz	New York Daily Advertiser—Redfield's MSS.
1830. Aug. 7	Jamaica	Redfield's MSS.
1830. Aug. 11-18	Dominica, St. Thomas, Barbados.	Schomburgk—Redfield's Track VI., Siliman's Jour., 5th Series, vol. xx. p. 34—Purdy, 7th edit., p. 101—Thomson, p. 406—Reid's Attempt to develop, &c., pp. 11-23, 128-132, Chart II.—Espy, p. 253-264—Evans—Johnston.
1830. Aug. 19-24	Martinique, U. S.	Purdy, 7th Edit., p. 102—Reid, Attempt to develop, &c., 3rd edit., p. 127-132.
1830. Aug. 23-26	Turk's Island, N. of the Bahamas.	Schomburgk—Redfield's Track IX.—Thomson, p. 416—Evans—Johnston.
1830. Sept. 29	Caribbean Islands, N. side.	Schomburgk—Redfield's Track VII.—Purdy, 7th ed. p. 102.
1830. Dec. 5, 6	American Coast from the lat. of 30° N.	Redfield's Track X., U. S. Naval Magazine, 1836, vol. i., and Lond. Naut. Mag. 1836, vol. v. p. 199.†
1831. April 27	United States..	Redfield's MSS.
1831.	Belize	Naut. Mag. 1842, p. 732.
1831. Jan. 13-15	Florida Stream	Evans—Redfield's Track X., U. S. Naval Magazine, 1836, vol. i.; and Lond. Naut. Mag. 1836, vol. v. p. 199.
1831. June 10	Florida	Redfield's MSS.

* Surely Mr. Johnston has taken these two hurricanes for one, for he says: "Aug. 17 at St. Martin and St. Thomas, and Aug. 28 at the Virgin Isles." Indeed no hurricane would travel so slow as to take 12 days from St. Martin and St. Thomas to the Virgin Isles. Besides this, it is shown by Mr. Redfield's track that the hurricane of the 17th of Aug. visited St. Martin and St. Thomas on the 18th; passed the north-east coast of Hayti on the 19th; Turk's Island on the 20th; the Bahamas on the 21st and 22nd; was encountered off the coast of Florida and South Carolina on the 23rd and 24th; off Cape Hatteras on the 25th; off the Delaware on the 26th; off Nantucket on the 27th; and off *Sable Island* and the *Porpoise Bank* on the 28th. But according to Mr. Johnston, having commenced on the 17th at St. Martin and St. Thomas, on the 28th it should have reached the Virgin Isles. Lieut. Evans has very well distinguished the two hurricanes, for he says: "1827, Aug. 28, a gale of greater violence than that of the 17th of Aug. raged in St. Thomas and the other Virgin Islands."

† This track also corresponds with that of the storm of Jan. 13-15, 1831.

DATE.	LOCALITIES.	AUTHORITIES.
1831. June 23-27	Trinidad, Tobago, Antigua, Grenada.	Redfield's Track I.—Piddington, 1st edit, p. 25—Schomburgk—Evans—Johnston—Purdy, 7th edit, p. 100—Antigua Almanac for 1832—William Mathieson's Tobago Almanac and Public Register for 1849—Grenada Almanac and Public Register for 1832.
1831. Aug. 10-17	Barbados, Cuba	Redfield's Track II. — Schomburgk — Purdy, 7th edit, p. 103—Reid's Progress of the Devel. of the Law of Storms, 1849, p. 35, and Attempt to develop, &c., 3rd edit, pp. 24-35, 43, 502, Chart III. —Halliday, pp. 29, 32-43—Piddington, 1st edit, pp. 25, 139, 165—Thomson, pp. 411, 416—Espey, p. 264—Evans—Johnston—St. Vincent Almanac for 1831, p. 84*—St. Christopher Almanac for 1835—Garnier, Météorologie, p. 168—Perrey, † Desiderio Herrera—Schomburgk.
1832. June 3-6	Cuba, Bahamas, Bermuda.	
1832. Aug. 7	Jamaica	Redfield's MSS.—Evans.
1833. Aug. 14	Guadaloupe, Antigua, Bermuda.	Redfield's MSS.
1833. Sept. 20	Dominica	Redfield's MSS.
1833. Oct. 16-19	Cuba, Gulf of Mexico.	Desiderio Herrera.
1834. Sept. 20	Dominica	
1834. Oct. 20, 21	Martinique	Springer's Barbados Almanac for 1842, Schomburgk—Warden—Johnston. ‡
1835. April 23	United States Coast.	Redfield, U. S. Naval Magazine, vol. I. 1836; Lond. Naut. Mag. 1836, vol. v. p. 199.
1835. July 26	Barbados	Evans—Johnston.
1835. Aug. 12-18	Antigua, Cuba, Galveston Bay.	Redfield's Track V.—Schomburgk—Piddington, p. 144 — Reid's Attempt to develop, &c., 3rd edit, p. 43 — Evans — Johnston.
1835. Sept. 3	Barbados	Schomburgk—Reid's Attempt to develop, &c., p. 35-41, Chart IV.—Mathieson's Tobago Almanac.
1835. Sept. 18	Matamoros, Gulf of Mexico.	Evans.
1835. Nov. 10	. . . . .	Redfield's Chart XI.—Espey, p. 97.
1836. Nov. 30 to Dec. 21	United States, Nova Scotia.	Loomis, Trans. Am. Phil. Society of Philadelphia, vol. vii. N.S. p. 125—Redfield, Am. Jour. of Science and Arts, vol. xviii., 2nd Series, 1843.
1837. July 9	Barbados, St. Lucia.	Schomburgk—Reid's Attempt to develop, p. 43—Barbados Globe, July 20, 1837—Phillips's Barbados Almanac for 1839, p. 97.
1837. July 26	Barbados, Cuba, § Martinique.	Schomburgk, pp. 62, 695—Reid's Attempt to develop, p. 47-57, Chart V.—Espey, p. 264 — Evans—Johnston — Barbados Globe, July 27, 1837—Phillips, p. 98—Jour. des Débats, 15 Sept.—Perrey.

* According to this almanac and Springer's Barbados Almanac, it was felt at St. Vincent on the 11th of Aug.

† On the 11th it was felt at St. Christopher.

‡ Mr. Johnston gives the date of 30-31, through an error.

§ By the N.E. of the Oriental department of Cuba.

DATE.	LOCALITIES.	AUTHORITIES.
1837. July 31	Antigua, St. Thomas.	Johnston.*
1837. Aug. 2-4	Antigua, St. Thomas, Barbuda.	St. Thomas Times, 5th Aug. 1837—Barbados Globe, Aug. 14, 21, and 28, and Sept. 7—St. Croix Gazette, Aug. 3—St. Christopher Advertiser, Aug. 7 and 8—Nevis Post, Aug. 2—Antigua Herald, Aug. 5, 12, and 19—Schomburgk—Knox, p. 215—Reid, Attempt to develop, pp. 48, 58-74, 86, Chart VI.—Evans—Johnston.
1837. Aug. 6	Little Antilles	Johnston.
1837. Aug. 12	N.E. of the Caribbean Islands.	Evans.
1837. Aug. 18-21	Lat. 30° 45' N., long. 77° 27'.	Evans.†
1837. Aug. 12-23	Turk's Island..	Schomburgk—Redfield—Reid's Attempt to develop, pp. 74-132, 1498, Chart VII.
1837. Aug. 31	St. Mark	Redfield—Reid's Attempt to develop, p. 119-224.
1837. Aug. 31 to Sept. 3	Apalachicola, U. S.	Reid's Attempt to develop, p. 124-126.
1837. Sept. 27 to Oct. 10	Gulf of Mexico	Redfield's Track XV.—Reid's Progress of the Develop., pp. 13, 299, and Attempt to develop, p. 133-143—Piddington, p. 144.
1837. Oct. 1-3	Yucatan Channel into the Sea of Mexico.	Evans.‡
1837. Oct. 26	Cuba	Desiderio Herrera.§
1838. Sept. 10	Bahamas	Reid's Progress of the Develop., p. 40, and Attempt to develop, p. 437—Evans—Johnston.||
1838. Nov. 1	Vera Cruz	Evans—Johnston.
1838. Nov. 26	Vera Cruz	Redfield's MSS.—Johnston.

* By the accounts given in the newspapers of St. Thomas, this hurricane seems to be the same which happened on Aug. 2 on that island.

† Lieut. Evans has taken the hurricanes of Aug. 12 and 18-21 as different; but according to his own account, and by examining the track traced by Col. Reid of the hurricane of the 12-23 of the same month, there is no doubt that the two mentioned by Lieut. Evans are the same as Col. Reid's. Lieut. Evans says that "on the 18th, 19th, and 21st of Aug., a most severe hurricane was experienced N. of the Florida Channel, by the Bristol ship *Felice*, Capt. Reynolds, lat. 30° 45' N., long. by chronometer 77° 27' W.; it lasted fifty-six hours; wind from E. to S. and W.S.W. This storm curved whilst the ship was involved in it." Speaking of the hurricane of the 19th of Aug. he adds, "on the 22nd had reached the 40th degree north." Now the hurricane of Aug. 12-23 traced by Col. Reid, curved precisely at the same lat. and long. as that of the 18-21 of Lieut. Evans. It remains now to ascertain if the other gale mentioned by Mr. Johnston on the 6th Aug. at the Little Antilles, is not also the same hurricane of Col. Reid on a track far east of the Little Antilles, and six days previous. However, it is probably that of the seven hurricanes of August, 1837: some will be found, by a closer examination, to be the same one on different tracks of its course.

‡ This seems to be the same gale in which the steam-packet *Home*, Capt. White, was lost on the 9th, about six miles north of Oglethorpe Light, U.S. She sailed from New York for Charleston.—Barbados Globe, Nov. 27, 1837.

§ Lieut. Evans says that "on Oct. 27 a hurricane of fourteen to sixteen hours' duration was felt at New Providence: it came from E.S.E. during the night." This hurricane is probably the same which passed over Cuba on Oct. 26.

|| Mr. Johnston says on Sept. 7 and 8.

DATE.	LOCALITIES.	AUTHORITIES.
1838. Nov. 26-28	Atlantic, European side.	Redfield—Traced by Reid, <i>Progress of the Develop.</i> , p. 323—Piddington, 2nd edit. p. 76—Milne, <i>Trans. of the Royal Society of Edinb.</i> 1839.
1839. June 9	Antigua	Colla, l. c. p. 154—Perrey.
1839. Sept. 8-14	Bermuda	Redfield—Reid's Attempt to develop, 3rd edit. p. 438-452, with a Chart; and <i>Progress of the Develop.</i> , p. 36, with a Chart—Piddington, 1st edit. pp. 27, 148, 157—Espy, p. 502—Lieut. Porter, <i>New York Herald</i> , Oct. 22, 1852—Johnston.
1839. Nov. 5	Galveston, near St. Louis Island, Gulf of Mexico.	Evans.
1839. Dec. 13-17	United States, North Atlantic.	Redfield, <i>Track XVI.</i> —Piddington, 2nd edit. p. 76—Traced by Reid, <i>Progress to Develop.</i> , p. 254, 302, 322—Espy, p. 183—Evans.*
1840. May 23	Madeira	Bermuda Royal Gazette, Aug. 11, 1840— <i>Philadelphia Gazette</i> .
1840. Sept. 16	Porto Rico	Bermuda Royal Gazette, Oct. 16, 1840.
1841. Oct. 3-6	Nantucket, U.S.	Bermuda Royal Gazette, Oct. 26, 1841— <i>New York Journal of Commerce</i> , Oct. 11, 1841.
1841. Oct. 6	Barbados, St. Lucia.	Bermuda Royal Gazette, Nov. 16, 1841.†
1841. Oct. 21-28	Bermuda	Bermuda Royal Gazette, Oct. 26 and Nov. 2, 1841.‡
1841. Nov. 28	Cuba	Desiderio Herrera.
1842. July 12	Acracoe, Cape Hatteras, U.S.	Evans—Johnston.
1842. Aug. 30 to Sept. 9.	Atlantic to the shores of Mexico.	Redfield's <i>Track XII.</i> —Piddington, pp. 25, 144, <i>Chart I.</i> , <i>Track XII. M.</i> —Reid's <i>Progress of the Devel.</i> , p. 295.
1842. Sept. 4	Cuba	Desiderio Herrera— <i>Reseña de los Estragos del Huracan de 1846</i> , p. 7—Redfield—Schomburgk.
1842. Oct. 2-10	Bermuda	Redfield's <i>Track XIII.</i> , <i>Silliman's Jour.</i> , 1846, p. 157—Piddington, p. 26, 154, 2nd ed., p. 155—Reid's <i>Progress of the Devel.</i> , p. 295.
1842. Oct. 24-29	Madeira	Bermuda Royal Gazette, Dec. 13, 1842—Piddington, 2nd ed., p. 3—Reid's <i>Progress of the Devel.</i> , p. 275.§
1842. Nov. 3	Lat. 36° 40', long. 61°.	Bermuda Royal Gazette, Dec. 13 and 27, 1842.
1843. Oct. 13	Florida	Moniteur Belge, Oct. 26, 1843.
1844. Feb. 22	Martinique	National, June 9—Perrey.

* Lieut. Evans marks Dec. 5.

† This hurricane seems to be distinct from that of Oct. 21-28, because it could not take fifteen days to reach Bermuda on the 21st; nor is it the same which happened in Oct. 3-6, at Nantucket on the American Coast, on account of having been felt at Barbados on the same day on which it ended on the American Coast.

‡ The brig *Grand Turk*, from Jamaica, bound to Baltimore, encountered this same gale on the 23rd, in long. 74° 30', lat. 37°.—*Bermuda Royal Gazette*, Nov. 16, 1841.

§ See the *Track* on the *Chart* in Reid's work.

DATE.	LOCALITIES.	AUTHORITIES.
1844. May 12	Lat. 37° 47' N., long. 65° 22' W.	Bermuda Royal Gazette, May 21, 1844.
1844. Oct. 3	Cuba	Desiderio Herrera—Schomburgk—Redfield's Track XIV., Silliman's Jour., vols. i. and ii. N.S. 1846—Piddington, pp. 26, 133, 160, 208, 213, 215, 283—Thomson, p. 418—Reseña de los Estragos del Huracan de 1846, p. 7—Reid's Progress to Devel., pp. 295, 303, 311—Bermuda Royal Gazette, Nov. 12, 1844—Johnston—Evans.
1845. Oct. 12	Florida Channel	Johnston—Evans.
1845. Oct. 22	Bermuda	Reid's Progress of the Devel., p. 265-269.
1845. Oct. 27	Bermuda, E. side	Reid's Progress of the Devel., p. 265.
1845. Nov. 9	Bermuda	Reid's Progress of the Devel., p. 349.
1846. Sept. 11-21	Barbados, Gun- daloupe, An- tigua.	Redfield's Track XIX.—Schomburgk—Thomson, p. 419—Reid's Progress to Devel., p. 374—Bermuda Royal Gazette, Oct. 6 and 13, Nov. 24, 1846—Evans—Johnston.
1846. Oct. 6-18	Cuba, United States.	Desiderio Herrera—Schomburgk—Redfield, Track XX.—Piddington, pp. 134, 193, 195—Bermuda Royal Gazette, Oct. 20, Nov. 3, 17, and 24—Thomson, p. 419—Reseña de los Estragos del Huracan de 1846—Piddington, 2nd ed. p. 155—New York Daily News, Dec. 21—New York Evening Mail, Nov. 6—Mission Record, Feb. 1847, vol. ii. p. 19—Johnston—Diario de la Habana, Oct. 15, 20—Moniteur Belge, Nov. 22, 1846.
1846. Dec. 9	. . . . .	Independance Belge, Dec. 23, 1846.
1847. Feb. 21	Atlantic	Reid's Progress of the Devel., p. 359-361.
1847. Oct. 10	Tobago, Trini- dad.*	Redfield—Bayley's Barbados General Almanac, p. 103—Mathieson's Tobago Almanac for 1849—Thomson, p. 409—Piddington, 2nd ed. p. 187—Evans—Johnston.
1848. Aug. 22 to Sept. 3.	Antigua	Redfield's Track XXI.—St. Christopher Almanac for 1855—Thomson, p. 421—Piddington, 2nd ed. p. 187—Reid's Progress of the Devel., p. 337; Track XXI.—Lieut. Porter, New York Herald, Oct. 22, 1852—Lieut. Maury's Sailing Directions, 6th edit., 1854, p. 309, plate x.
1848. Sept. 19	Barbados, St. Christopher.	Reid's Progress of the Devel., pp. 337, 358.
1848. Dec. 16	Atlantic	Reid's Progress of the Devel., pp. 362, 364-367.
1849. March 27	Lat. 48° N., long. 20° W.	Reid's Progress of the Devel., p. 334.
1850. March 30	Nassau	St. Vincent Almanac for 1851, p. 119—Moseley's Bahamas Almanac and Register for 1854.
1850. July 14-16	Southward and Westward Isles.	Bermuda Royal Gazette, July 23 and Aug. 6.

* This hurricane commenced at lat. 12° and long. 53° on Oct. 10, and passed over Tobago on Oct. 11.

DATE	LOCALITY	AUTHORITY
1850. Aug. 21	Cuba	Andrés Poe, <i>Anales de las Reales Juntas de Fomento y Sociedad Económica de la Habana</i> , vol. iii. 1850, p. 42— <i>Boletín del Faro Industrial</i> , Aug. 22.
1850. Sept. 2	St. Nicholas, Cape Verde Islands.	Redfield, <i>Amer. Jour. of Science and Arts</i> , vol. xviii. 2nd series, 1854.
1850. Oct. 14	Lat. $24^{\circ} 59'$, long. $47^{\circ} 10'$.	Redfield, <i>Amer. Jour. of Science and Arts</i> , vol. xviii. 2nd series, 1854, Track XXV.
1850. Oct. 18	Lat. $25^{\circ} 58' N.$, long. $41^{\circ} 19' W.$	Redfield, <i>Amer. Jour. of Science and Arts</i> , vol. xviii. 2nd series, 1854, Track XXVI.
1851. Aug. 16-28	St. Mark, Florida, St. Christopher, St. Thomas, Cuba.	St. Christopher Almanac for 1855— <i>New York Herald</i> , Oct. 23, 1852— <i>Bermuda Royal Gazette</i> , Sept. 2, 1851—Redfield, Track XXII.— <i>Indépendance Belge</i> , Sept. 28, 1851.
1851. July 10	Barbados, St. Domingo, St. Christopher.	St. Vincent Almanac for 1851, p. 123—St. Christopher Almanac.
1852. Jan. 19	Vera Cruz . . .	<i>El Eco del Comercio de Vera Cruz</i> , 14 de Enero, 1852— <i>Indépendance Belge</i> , March 4 and 20, 1852.
1852. Sept. 22-26	St. Christopher, St. Eustatius, Porto Rico.*	St. Christopher Almanac for 1855— <i>Bermuda Royal Gazette</i> , Oct. 12— <i>Liverpool European Times</i> , Nov. 6, 1852— <i>New York Express</i> , Oct. 19, 1852— <i>Lieut. Maury's Sailing Directions</i> , 6th edit., 1854, plate xvii. p. 314— <i>Indépendance Belge</i> , Oct. 21, 1852.
1852. Oct. 9	St. Mark, Florida	<i>New York Herald</i> , 20, 23 Oct. 1852.†
1853. Aug. 30, Sept. 11.	Cape Verde, Hatteras, U.S.	Redfield's Track XXIV., <i>Amer. Jour. of Science and Arts</i> , vol. xviii., 2nd series, 1854— <i>Annals of Science</i> , conducted by H. L. Smith, Cleveland, U.S., vol. ii., Feb. 1854, p. 47.‡
1853. Sept. 27	Lat. $35^{\circ} 19'$, long. $56^{\circ} 36'$.	Redfield, <i>Amer. Jour. of Science and Arts</i> , vol. xviii., 2nd series, 1854—Capt. Maclean, in the <i>London Shipping Gazette</i> , Nov. 8.

* This is the same gale which Capt. Frith of the brigantine 'Lady Chapman' encountered near St. Eustatius, lat. 20° , long. $65^{\circ} 15'$, on the 26th; and which dismasted on the 30th the American brig 'Eolian,' Capt. Jordan, bound from New York to St. Juan de Nicaragua. This gale passed 250 miles E. of Barbados, and in the last week of September touched W. of Bermuda.—*Bermuda Royal Gazette* of Oct. 5 and 12, 1852. The *Montserrat papers* state that it was the most severe that has been experienced for the last thirty years.

† This may be the same gale that was felt at Prince Edward Island on the 15th of the same month, and at Sydney, N.S. Bark 'Vesta,' from Savannah for Boston, which sailed on the 15th, encountered on the 15th a terrific gale, which lasted 72 hours. *N. Y. Herald*, Oct. 28.—The brig 'Empire,' which arrived at Galveston on the 13th from New York, met a severe storm on the 30th Sept. *Galveston Civilian*, 15th Oct.; *N. Y. Herald*, 27th Oct. 1852.

‡ This is the last hurricane traced by Mr. Redfield, which traversed a distance of 7276 miles in about 12 days; at an average progression of nearly 26 miles an hour. The average progress of the storm while in the inter-tropical latitudes was near 13 miles per hour; but in the higher latitudes this rate was greatly increased, and after passing the Banks of Newfoundland the progress of the storm was equal to about 50 miles per hour.

DATE.	LOCALITIES.	AUTHORITIES.
1853. Sept. 28	Lat. 15° N., long. 34° 50' W.	Lieut. Maury's Sailing Directions, 6th edit. —Redfield, Amer. Jour. of Science and Arts, vol. xviii., 2nd series, 1854.
1854. Oct. 21	Bermuda	Bermuda Royal Gazette, Jan. 2, 1855.
1855. Jan. 20	Baltimore to Halifax, U.S.	Bermuda Royal Gazette, Feb. 6, 1855.
1855. Feb. 10	Bermuda	Bermuda Royal Gazette, Feb. 27.
1855. May 24	Trelawny	Bermuda Royal Gazette, June 19.*
1855. Aug. 25, 26	Martinique, St. Domingo.	France d'Outremer—Gazette de France, Sept. 26, 1855.—Le Siècle de Paris, Nov. 7—Schomburgk—London Athenæum, Nov. 3, 1855, p. 1273.

TABLE showing the Monthly Distribution of 365† Cyclonic Hurricanes which have occurred in the West Indies and in the Atlantic Ocean within 362 years, from 1493 to 1855.

Months.	No. of Hurricanes.	Months.	No. of Hurricanes.
January	5	July	42
February	7	August	96
March	11	September	80
April	5	October	69
May	5	November	17
June	10	December	7
Total	365		

This record shows that hurricanes have occurred in every month of the year, although they seem to be far more frequent from July to November, especially during August and September.

If we examine the distribution of hurricanes by centuries, according to my table, we come to the following conclusion :

Centuries.	No. of Hurricanes.
From 1493 to 1500	6
" 1500 to 1623	16
" 1623 to 1700	32
" 1700 to 1800	159
" 1800 to 1855	188
Total	400

It is to be observed that for the last half century my records show more cases of hurricanes than for any century previous, and that the 18th century offers also five times as many hurricanes as the 17th century, and so on. But it would not be prudent to deduce from this remark, that hurricanes have occurred with less frequency during the previous centuries than in the last ; for as I have observed several times, in my investigations on the phenomena of hailstorms, lightning, and earthquakes in Cuba,‡ we are for the most part in

* 1855, Aug. 26, Santo Domingo, Schomburgk. See London Athenæum, Nov. 3, 1855.—Ed.

† Although my Table comprises 400 hurricanes, yet there are 45 of which the month has not been ascertained.

‡ See my Memoirs on Hailstorms in Cuba in the *Annales de Chimie et de Phys.*, 3e. série, t. xlv.; on Lightning Storms in Cuba and the United States of America, in the *Annuaire de la Société Météorologique de France*, t. lii. p. 41 ; and the Chronological Table of Earthquakes which have occurred in Cuba from 1551 to 1855, in the *Nouvelles Annales des Voyages*, June, 1855.

want of meteorological data to establish any laws from the little materials which science possesses. It is only from the commencement of this century, and more especially from 1831, when Mr. Redfield drew the attention of philosophers and observers by his important discovery, that the phenomena of hurricanes have been more closely studied and observed.

A BIBLIOGRAPHICAL LIST of 450 Authors, Books, and Periodicals where some interesting accounts may be found, especially on the West and East Indian Hurricanes. By Andrés Poey, of Havanna, Cuba.

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